

CITY *of* NEWARK  
WASTE UTILIZATION STUDY

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**CITY OF NEWARK  
OFFICE OF RECYCLING**

**WASTE UTILIZATION STUDY**

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WASTE UTILIZATION STUDY  
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**CITY OF NEWARK  
OFFICE OF RECYCLING  
WASTE UTILIZATION STUDY  
EXECUTIVE SUMMARY**

**INTRODUCTION**

The City of Newark Department of Engineering contracted with Self-Reliance, Inc. (SRI) of Washington, D.C. in 1983 to conduct a waste utilization study -- an examination and analysis of waste products and practices and the opportunities to reduce those wastes while stimulating economic development activities. The study refers to resulting activities as "waste utilization" or "reclamation" enterprises. These involve the repair, reuse, remanufacture and recycling of products or materials. By analyzing opportunities for reduction of Newark's waste stream, this study is intended to catalyze new developments in recycling, guide the City through immediate recycling implementation, and provide a coherent and practical strategy for immediate, intermediate, and long-term development of more sophisticated and economically far-reaching waste utilization enterprises. The strategy emerges from historical conditions, institutional arrangements, currently available technology, financing arrangements, and the economic development and solid waste management priorities of people making decisions affecting those activities in the City of Newark.

**EXECUTIVE SUMMARY**

Three developments motivated this study: the increasing cost of waste disposal; state and county solid waste policy; and the availability of funding from the New Jersey Recycling Act. The three projects and activities that comprise the study include

1. The Waste Utilization Study;
2. Preparation of a Plan of Action to implement the findings of the Waste Utilization Study;
3. Presentation of findings and results to the City of Newark Municipal Council.

The entire project was conducted over a 34 month period, from January, 1984 through October, 1986.

The intent of this study is to identify methods which will decrease Newark's waste stream through reclamation of materials and products. It is predicated on the desire to maintain or enhance the activities of the salvage sector and involve community organizations and other entrepreneurs recovering materials from the waste stream. This is possible because materials kept out of landfills have value when processed, and because landfilling will no longer be an option as the State of New Jersey closes them for environmental reasons. The planned waste-burning Energy Recovery Facility (ERF) to be located in the City of Newark has been downsized to allow for recycling: it is the position of the County of Essex, the Port Authority of New York and New Jersey, and the City of Newark that the plant's operation will be improved by removing recyclable materials prior to burning. Recycling and the development of similar waste utilization enterprises provide the opportunity for economic development while the costs of solid waste management are decreased. The potential benefits include business development, the creation of jobs, energy conservation, the conservation of natural resources, and environmental protection.

Other aims of the study are to increase the business community's understanding of the many benefits associated with recycling and waste utilization; to evaluate and recommend supportive institutional arrangements; and to promote a healthy environment for cooperative development of the public and private sector.

The Waste Utilization Study contains the following information:

- (1) review of the history of waste utilization in Newark;
- (2) review and diagnosis of institutional arrangements in Newark;
- (3) discussion of waste utilization methods applicable to Newark;
- (4) identification of possible individuals, corporations, civic organizations, and government agencies which should participate in such programs;
- (5) outline of technical considerations and methods to enhance program development;
- (6) recommendations for the City of Newark which consider the goals of the State of New Jersey and Essex County.

Following are summaries and key findings of each chapter.

## CHAPTER 1: PHILOSOPHICAL ORIENTATION.

After presenting background information, Chapter One offers a discussion of Urban Self Reliance and three key concepts which form the nucleus of this document.

### URBAN SELF-RELIANCE

American cities are dangerously dependent. Like developing nations, they spend billions of dollars to import energy, food, raw materials, and finished products. Money earned in cities flows out of their borders to absentee owners of land, buildings, factories, to non-resident employees, and to higher levels of government. Local resources are inefficiently used or managed. Valuable raw materials such as refuse are buried or burned at a net cost to the cities. The productive capacities of youth, elderly, and the unemployed are underutilized.

Cities and neighborhoods, even the poorest ones, have wealth. The goal of local self-reliance is to put this wealth to work and to keep the benefits in the cities. The self-reliant city extracts the maximum value from its raw materials, its technologies, its buildings, and its people. It emphasizes production and efficient use of resources over consumption. It relies on many locally-owned small businesses, rather than on a few factories owned by remote corporations. Its development plans and policies are integrated to promote self-reliance.

By using the products and wastes of one process as the raw materials for others, the self-reliant city is able to retain and harness the value added by each stage of processing or manufacturing. As an illustration, it costs about a penny to throw away an aluminum can. Recycled, aluminum cans are worth 20 to 30 percent more. Shredded, baled or otherwise packed, their value increases by 45 percent, and smelted into ingots, the value increases by more than 50 percent. Fabricated into storm-window frames, the value increases over one hundred percent. Each addition of value increases jobs and income.

Local self-reliance stimulates initiative and gives self-confidence to citizens. In the self-reliant city, citizenship means active participation. Citizens are not only consumers, but also producers of wealth and managers of a city's future.

### KEY CONCEPTS OF CHAPTER ONE:

In seeking to develop waste utilization and recycling, the recycler must compete with two powerful forces: the disposal ethic and the virgin materials manufacturing industry. Reliance on our "quick-and-easy" disposal system acts as a disincentive to recycle. The recycler must first confront the garbage establishment and the century-old emphasis on mixed waste collection and disposal in order to have any materials with which to work. Secondly, the recycler must compete with the more powerful virgin materials industry.

- A. The Solid Waste Disposal Theory presents the current paradigm of solid waste management as having evolved from the concern of turn-of-the-century public health experts who realized that waste was the cause of disease and other problems. They successfully promoted increased frequency of waste pick ups, minimized human handling and eliminated disease through isolation of garbage and its encapsulation in landfills. While addressing immediate concerns, sanitation-based waste disposal created long range problems which have only been recognized recently.

As these problems occur and landfill options disappear, society finds it difficult to re-think this paradigm and develop viable alternatives. Mixed material collection is assumed. Increased costs have made waste disposal expenditures paramount in municipal budgets. Maintaining this system decreases the value of the disposed materials while the cost in labor to separate, collect and recycle becomes excessive. Consequently, only the most pure and uncontaminated wastes -- that is, the most economical -- are recovered, and the much larger balance (approximately 90% in Newark) are discarded.

- B. The Virgin Materials Industry represents a powerful obstacle to recycling in its discrimination against secondary materials. The virgin materials industry is growing much faster than the secondary materials industry, and working from a broader base. The industry has huge capital and resource commitments to the consumption of raw materials, and is encouraged to continue this practice by federal capital gains and depletion allowances. The difference in profitability between secondary and primary materials is not great enough to attract capitalization to secondary materials capacity. Unlike most recycling industries, the virgin materials industry is vertically integrated, providing a powerful marketing tool and the ability to internalize costs. In addition, freight practices discriminate against the transportation by rail of secondary materials.

Thus, the recycler competes for materials under a system that reinforces sanitation over reclamation and favors the use of virgin materials over secondary materials. While overcoming these obstacles is a formidable task, the environmental and economic dilemma presented by the solid waste crisis is undeniable. Recycling was a prominent activity in the country through the 1940's. Institutional changes in recent years have resulted in reduced recycling levels. Significant change and improvement can be brought about through renewed and reoriented institutional development that supports recycling. Since no "quick fix" solution to disposal problems is available, recycling holds promise as one element of integrated waste management, and can contribute significantly to the solution of the waste disposal crisis.

- C. The Hierarchy of Reclamation is another important concept presented, in which the goal is to maintain or retrieve the value of the original product while maximizing both waste diversion and economic benefits for the City of Newark. According to Dr. Robert T. Lund of the Massachusetts Institute of Technology, there are four levels of reclamation. Each involves a different set of costs to recover the economic value retained in a product after it has been used. These stages are repair, reuse, remanufacture and recycling. Repair represents the first recourse in the event of product malfunction. Reuse through sale, barter or give-away retains product value at low additional costs. Remanufacturing of a product occurs when it is no longer practical to repair a product; this is the restoration of a worn out product to like-new conditions. When a product is disposed of, wears out, or becomes obsolete, recycling recovers the value of the material components, diverting this material from the landfills.

Waste utilization enterprises may fall into one or a number of reclamation levels. It is important to note that "higher" use options are generally more conserving of economically valuable and scarce resources; product value has more worth than elemental value -- breaking down a product to its elementary components.



## **CHAPTER 2: HISTORY OF WASTE UTILIZATION.**

Chapter Two reviews in general terms the history of waste utilization in the U.S., and looks specifically at those waste utilization ventures pursued by the City of Newark. The presence of the Port of Newark and the manufacturing character of the city have led the survey team to a discussion of Newark as a hub for recycling, with local markets for virtually all recyclable materials. A sizable and well entrenched salvage industry is already in place, and market conditions are excellent for the development of other waste utilization industries.

The City's previous involvement in recycling has taken the form of support for private ventures which promised public benefits. Recycled material procurement policy, a composting project, and generous support of a major quasi-public recycling venture (Newark Recycling, Inc.) were the focus of the greatest amount of City effort. While all of these ventures eventually failed, they provide valuable learning experiences for renewed efforts.

The City has also provided support in the past to two other waste utilization projects: the production of fireplace logs from leaves, and tire recycling; neither venture was successful. In 1972 the Municipal Council passed a Recycled Materials Procurement Policy which has not been implemented. This was due in part to resistance from the primary materials industry, in the form of threats by the copy machine vendor who supplies paper for the machines and who claimed recycled paper would invalidate the warranty on the machines. (It was also true that recycled paper of the early 1970's posed flaking problems which have since been resolved.)

The Herbert Place Composting Project was a cooperative venture of the City of Newark and The Urban Gardening Program in the late 1970's. It was to be located on an empty lot, which unfortunately attracted illegal dumping. When the City was unable to resolve the dumping problem, the project was abandoned. An evaluation of the problems associated with the project led the City to secure a more suitable location for re-establishing a composting project.

Newark Recycling Inc. (NRI) was a non-profit corporation which evolved from a City-run program. Organized as an ex-offender training program, it moved into the collection of high grade papers as more ambitious attempts to do curbside collection and post-consumer recycling failed. Subsidies dwindled between 1980 and 1983, and the program suffered financial losses and went into debt. Recognizing the need to become a regular business, NRI reorganized to absolve the debt. Unfortunately, a devastating fire in 1983 interrupted these plans and the organization dissolved in bankruptcy the same year.

### **KEY CONCEPTS OF CHAPTER TWO:**

The common lesson in each of these early ventures was the need to understand the realities of salvage practices and provide supporting institutional development.

## **CHAPTER 3: ANALYSIS OF WASTE MANAGEMENT INSTITUTIONS AFFECTING NEWARK.**

Chapter Three reviews and analyzes the public and private sectors as they relate to solid waste management and reclamation. It identifies the State of New Jersey's Solid Waste Management Act (NJSA 13:1 et seq.) as the statutory context for Solid Waste Management and recycling initiatives by state and municipal government. Relevant City and County ordinances are examined as are the City's agencies and elected officials for the roles they play. Particular attention in this section is paid to identifying institutional barriers to the development of waste utilization and recycling enterprises.

Chapter Three also discusses the salvage sector, neighborhood and community organizations, and regional, County, and State agencies involved with recycling.

## KEY CONCEPTS OF CHAPTER THREE:

- o Title 13A of the Revised Ordinances of the City of Newark, "Administration and Regulation of Solid Waste", and Title 8, Chapter 8 of the Revised Ordinances of the City of Newark, "Junk Shops, Junk Goods and Metal Processing Facilities", contain provisions which conflict with the needs of recycling development; these provisions should be amended.
- o Essex County Ordinance 00220 includes provisions which effectively ban recyclables from the Energy Recovery Facility by refusing wastes which contain "more than negligible amounts of recyclables." The policy also prohibits introduction of any measure to preclude or inhibit the expansion of recycling.
- o In general, successful programs have been accomplished by informal networks of people at all levels in City government, whose efforts have been able to compensate for the lack of formal institutional structures.

## CHAPTER 4: THE DYNAMICS OF SUPPLY AND DEMAND.

Chapter Four discusses the nature of supply and demand in relation to the dynamics of reclamation in general, and recycling in particular. Chapter Four explains that market demand is the key to viable recycling efforts, and classifies supply and demand as "existing" or "potential". The powerful influence of the virgin materials industry is also discussed, followed with a presentation of supply and demand profiles which examine materials and products present in Newark's waste stream, and identify markets for those derivatives.

## KEY CONCEPTS OF CHAPTER FOUR:

- o Based on data made available to the Survey Team, 32% of Newark's waste is organic, with potential supply value for composting; 34% is recyclable, 27% is burnable and 6.9% is inert fines.
- o 3% to 7% of the waste stream is the annual leaf fall.
- o Corrugated containers are the second largest category of recyclables -- 16% of the waste stream.
- o Markets are available in the area for the following materials meeting mill specifications:
  - Ledger and computer papers
  - Crankcase oil
  - Select post-industrial scrap
  - Corrugated
  - Newsprint
  - Aluminum used beverage containers
  - Ferrous and nonferrous scrap
  - Glass cullet (flint)
- o Markets which will require development include:
  - Mixed paper
  - Food wastes
  - Glass cullet (colored)
  - Tires
  - Yard wastes
  - Compost
  - Plastics (including PET containers)
  - Magazines

## CHAPTER 5: WASTE UTILIZATION ENTERPRISES.

Chapter 5 discusses the significance of collection and processing systems and proceeds to identify technological options and funding sources to implement Waste Utilization Enterprises.

## KEY CONCEPTS OF CHAPTER FIVE -- TECHNOLOGICAL OPTIONS AND FUNDING SOURCES:

### Multi Material Recovery:

- Neighborhood Collection Centers
- Curbside Collection
- Intermediate Processing Centers

### Mixed Waste Processing Systems:

- Glass and Plastics
- Glass Market Report
- Plastics

### Paper Collection and Processing Technologies:

- Cellulose Insulation
- Animal Bedding

### Composting Technologies:

- Paunch Manure
- Vermicomposting

### Automobile and Truck Tire Processing:

- Crumb Rubber
- Tire Shredding/Processing/Reuse

### Demolition Waste Recovery and Processing:

- Building Materials Salvage
- Recycled Concrete
- Remanufacturing of Materials

### Energy-Related Technologies:

- Processed Wood for Fuel
- Steam and Energy Generation

Sources of possible financial support for enterprise development include:

1. City of Newark
2. Essex County
3. New Jersey Office of Recycling
4. New Jersey State Economic Development Administration
5. New Jersey Natural Resources Bond Act
6. New Jersey Private Industry Loan Program
7. Port Authority of New York/New Jersey
8. The Campaign for Human Development
9. Local de facto or ad hoc corporate support
10. Program-related private investment
11. Grants or loans from existing firms
12. Community Development Block Grants
13. Local sheltered workshops

## CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS.

Chapter Six reviews the first five chapters, and presents conclusions and recommendations. Chapter Six concludes that Newark is experiencing the best and worst of recycling times. The City has a history of promoting recycling and solid waste management; a sizable salvage industry exists; local and export markets are available for reclaimed materials; funding is available from a variety of sources. Past experience has been valuable; yet the City has been set back by several well-intentioned but poorly managed City-initiated or City-supported recycling and waste utilization efforts. These experiences and current market conditions point to the need for integrated planning and comprehensive approaches to broaden and sustain such activity. Recycling and solid waste management must be considered integral functions of all City decisions if the waste reduction and economic development opportunities of reclamation are to be realized.

### KEY CONCEPTS OF CHAPTER SIX -- RECOMMENDATIONS:

- I. The City should adopt, as policy, the support of waste reduction and economic development through recycling and the development of waste utilization enterprises, facilitating this process through public/private partnership and private enterprise.
- II. The City should form an ad hoc Blue Ribbon Recycling Committee to:
  - a) Assist in implementing the findings of this study.
  - b) Consider the recommendations for institutional change.
  - c) Help formulate the immediate, intermediate, and long term recycling goals of the City.

This Committee should act as a planning group for other waste utilization enterprises and as an advisory board to the City's Recycling Program Coordinators.

- III. The following City agencies should coordinate existing functions to promote and enhance recycling development:
  - a) Department of Engineering
  - b) Mayor's Office
  - c) Newark Economic Development Corporation
  - d) Newark Board of Education
  - e) Love Newark...Keep it Clean
- IV. The City of Newark Municipal Council should enact changes in Title 13A and Title 8, Chapter 8, of the Revised Ordinances of the City of Newark.
- V. City staff should maintain a legislative vigilance for State, County and regional decisions which will positively or negatively affect the City's recycling plans, policy, and programs.
- VI. City staff should initiate activity to create the following enterprises in order to meet the State recycling goal of 25% recovery by 1987:
  - a) Recycling Collection Center Network.
  - b) Curbside Collection Network.
  - c) City Composting Program.
  - d) Office Paper Recovery Program.
- VII. The City should enforce procurement policies already in place for recycled paper and work to implement other policies for the procurement of recycled commodities, where appropriate, and for the recycling of commodities which are currently used (e.g., motor oil from City fleet vehicles).



## DOCUMENT GLOSSARY

## DOCUMENT GLOSSARY

<b>Aggregation</b>	- Accumulation or collection of discards before processing and/or shipment to market.
<b>Bottle Law</b>	- A law placing a deposit on containers, usually only on those used in the packaging of beer, malt beverages, soft drinks, and mineral water. At time of purchase consumers pay a deposit, which is refunded upon return of the containers to the vendor.
<b>Buy Back</b>	- The act of purchasing recyclable materials, especially used aluminum and glass containers, newspaper, and certain specific, easily identifiable items.
<b>Buyback Center</b>	- An act or facility that purchases products from suppliers and that may or may not process the materials for delivery to market.
<b>Cellulose</b>	- Fibers derived from wood products (cellulosic material).
<b>Collection</b>	- Pick up or delivery of discards (see also, separate and integrated collection and collection center).
<b>Compost</b>	- The end product of the composting process, referred to as humus, organic compost, and soil amendment. Composting is bio-degradation of organic material in the presence of oxygen, heat, and water.
<b>Contaminant</b>	- A substance or material mixed in with a discard that is targeted for recycling. For example, food residues are contaminants to ferrous can recycling.
<b>Discard</b>	- An item which the original owner has no further use. Discards may be valuable or they may have no obvious value; they may be suitable for reuse, repair, remanufacturing, or recycling discards may be categorized by their material value [e.g., metal (ferrous and aluminum), cellulosic fiber, polymer (plastic and rubber), and glass], or by their form as a product [e.g., a metal spade, wooden stake, steel spring, container].
<b>Disposal</b>	- The act of dumping, burning, or land burial, or long-term surface and subsurface storage of discards in such a way as to render the discard unreclaimable. Refers also to sanitary landfill where discards are buried daily.
<b>Elemental Recycling</b>	- Recycling of a discard for the value of its Recycling substances and elements. Elemental recycling of newspaper is the recycling of cellulosic fibers that go into paper production.
<b>Garbage</b>	- The meat and vegetable waste solids resulting from the handling, preparation, cooking and consumption of foods. Garbage shall be considered to originate primarily in kitchens.
<b>Grading</b>	- Sorting of a mix of materials into homogeneous categories by hand or with hand tools (see sorting). Also referred to as highgrading.
<b>High-grade</b>	- The act of upgrading or improving an aggregation of discards by separating out various homogeneous components to increase their value, decrease their transport cost, or otherwise render each component group of discards more recyclable.

<b>Integrated Curbside Collection</b>	- Combined collection of source-separated recyclable materials and refuse simultaneously, with the same equipment, or on the same route.
<b>Intermediate Processing Center</b>	- A facility where several types of discards are brought for waste material decontamination, processing, and preparation (IPC) for return to the economic mainstream as an industrial feedstock. In the glass industry an IPC is a plant where broken glass (cullet) is crushed, and the metal and contaminants removed by mechanical or hand sorting. The resulting feedstock is called "furnace-ready cullet." The term "intermediate" refers not only to the nature of the product, but to the type and level of technology employed most intermediate processing facilities. Intermediate processing technology is characterized by some form of conveyor-fed densification, sorting/separation, decontamination, and storage.
<b>Market</b>	- The end user or intermediate processor of recycled materials; the purchaser who normally purchases discards from suppliers.
<b>Mulch</b>	- Any organic substance used to shield land from erosion. Mulching refers to the act of applying mulch.
<b>New Jersey Recycling Act</b>	- The 1981 law (P.L. 1981, c278) describing the goals, objectives, and program of the State of New Jersey in the area of waste reduction, recycling, and disposal alternatives (also known as N.J.S.A. 13:1 et seq.).
<b>PET</b>	- Polyethylene terephthalate, a petrochemical used in the manufacture of clear plastic beverage containers.
<b>Plastics</b>	- Roughly 40 families of polymers (petroleum derivatives) that are increasingly substituting glass, metal, wood and other materials. They are divided into two types: thermosets (non-remeltable) and thermoplastics (remeltable).
<b>Postconsumer</b>	- After the consumer; postconsumer materials are the residues of materials and items that are purchased by consumers. Postconsumer is distinguished from postcommercial and postindustrial materials.
<b>Primary material-</b>	A raw material consumed in the manufacture of products. Normally refers to virgin raw material.
<b>Processing</b>	- Any activity that improves, enhances, or otherwise changes the character of a discard or discards. Unlike highgrading, processing usually involves mechanical or chemical modification of the discarded material.
<b>Recyclable</b>	- The quality of being composed of a material that can be returned to the economic mainstream as a feedstock to new manufacturing.
<b>Recycling</b>	- The collection, processing, transportation, and end use of discarded materials, substances, or items. Material recycling refers to the use of discards for their elemental or material content to form new products. Product recycling refers to keeping an item in its original form for reuse, repair, or remanufacture. Also referred to as salvaging, reclamation, and recovery.
<b>Refillable</b>	- A container that can be refilled.
<b>Refuse</b>	- Mixed waste materials discarded by households and businesses.

<b>Remanufacture</b>	- The process by which large quantities of similar product cores are brought to a central facility and used as the foundation for manufacturing. The cores are collected and disassembled; the parts are sorted and refurbished; "new" items are created from reassembled cores and parts. Parts from a specific product are not kept together.
<b>Resource Recovery</b>	- The reclamation of discarded materials for their resource value. "Resource Recovery" as a term has become closely associated with energy recovery that captures only the BTU value of materials as they are incinerated and the resulting heat to generate steam. Also used to mean materials recovery from mixed or comingled waste or recyclables by a series of mechanical separation processes.
<b>Returnable</b>	- A whole container that can be returned to its source, usually for reuse in its original application. Ordinarily refers to beverage containers that carry a refund value.
<b>Reuse</b>	- The act of using an item again in its original form with or without cleansing.
<b>Salvage Industry</b>	- Infrastructure of formal and informal enterprises engaged in recovery and processing of recyclable materials.
<b>Sanitation</b>	- Organized activity of waste removal usually applied to solid waste management.
<b>Secondary Material</b>	- A material reclaimed from a manufactured item, or material that has already been used in some form.
<b>Separate Collection</b>	- Collection of source-separated recyclables materials, with different vehicles or personnel from those used in garbage (solid waste) collection.
<b>Solid Waste</b>	- Garbage, refuse, and other discarded materials resulting from industrial, commercial, and agriculture operations and from domestic and community activities, and shall include all other waste materials including liquids disposed of incident thereto except it shall not include solid animal and vegetable wastes collected by swine producers licensed by the State Department of Agriculture to collect, prepare, and feed such wastes to swine on their own farms.
<b>Sorting</b>	- Separation of materials by uniform characteristics or the separation of recyclables from nonrecyclable items, contaminants, or recyclables of a different type or grade.
<b>Source Reduction</b>	- The reduction of waste generation at the source or site of manufacture or consumption by separate storage of used items, or, in the case of manufacturing, by new production techniques, product package redesign, and/or institutional design. Also reduction of residential waste by storing some recyclable and reusable items in such a way that they are distinguished from garbage.
<b>Source Separation</b>	- The separation of recyclables from non-recyclables wastes, and the storage of those materials as separate from the storage of garbage.
<b>Transfer Station</b>	- Aggregation point for efficient transfer of mixed waste to distant disposal sites.
<b>Value Added</b>	- Incremental value of labor or energy that accrues to an item or material by virtue of highgrading or processing it, or by other production and manufacturing processes that result.



**Waste  
Utilization**

- Transformation of waste materials into new products based on all facets of reclamation, including repair, reuse, remanufacture, recycling, or energy recovery.

**Vertical  
Integration**

- The joining of a number of stages in the manufacturing process under one parent company or corporate group. A corporation that owns bauxite mines, aluminum smelting facilities, and can manufacturing production lines is integrated vertically because it controls more than one stage in the production process. Vertical integration allows the parent group to internalize certain costs, making internally produced feedstocks more cost-effective than those purchased outside.

# CITY OF NEWARK OFFICE OF RECYCLING

## SOLID WASTE UTILIZATION STUDY

### CHAPTER 1: INTRODUCTION -- PROJECT OVERVIEW AND DESCRIPTION

#### 1.1 PROJECT BACKGROUND

In 1983 the City of Newark Department of Engineering contracted with Self-Reliance Inc. (SRI) of Washington D.C. to conduct a waste utilization study that would examine and analyze waste products and practices and the opportunities to reduce those wastes while stimulating economic development. This study refers to the repair, reuse, remanufacture, or recycling of discarded products or materials as "waste utilization" or "reclamation" enterprises.

This study is expected to catalyze new developments in recycling, to guide the City through immediate recycling implementation, and to provide a coherent and practical strategy for developing more sophisticated and economically far-reaching waste utilization enterprises over time. The strategy emerges from historical conditions, institutional arrangements, available technology, financing arrangements, and the management priorities of the current decision makers affecting Newark's waste utilization activities.

Three developments have motivated this study: the increasing cost of waste disposal (See Table 1-1), state and county solid waste policy, and the availability of funding from the New Jersey Recycling Act. The three projects and activities comprising the study are:

1. The Waste Utilization Study
2. A Plan of Action to implement the findings of the Waste Utilization Study
3. Presentation of findings and results at an open forum and to the City of Newark Municipal Council

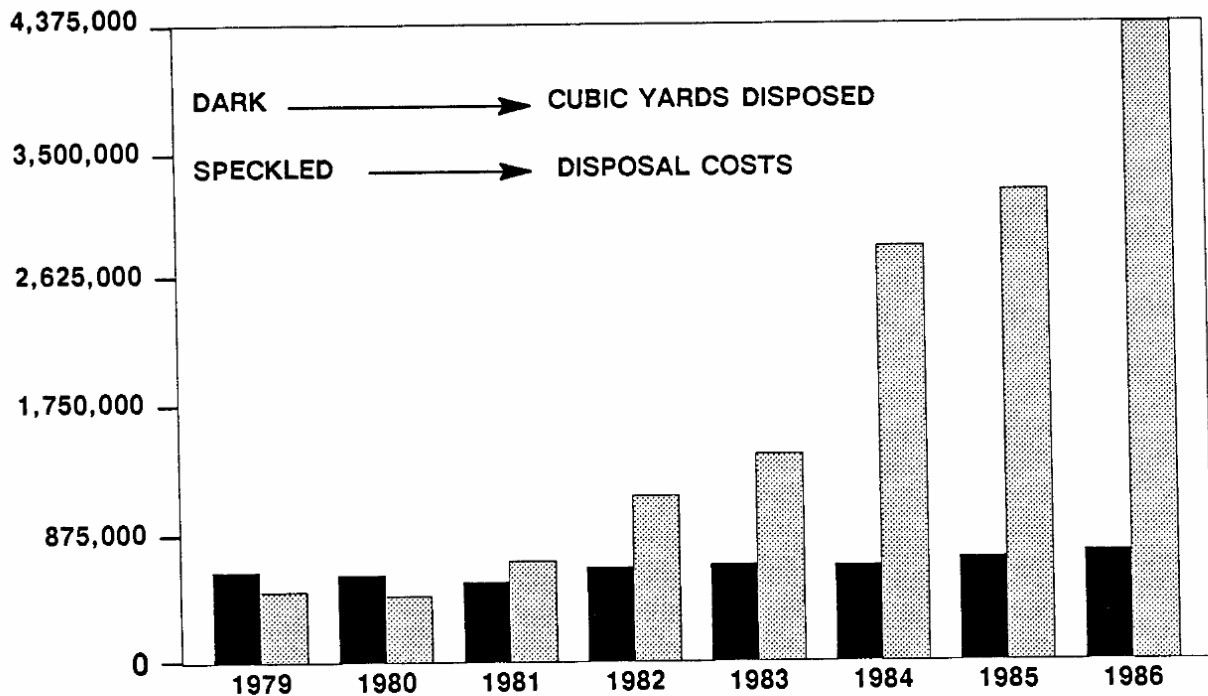
The entire project was conducted over a 34-month period, from January 1984 through October 1986.

Intended to identify methods that will decrease Newark's waste stream through reclamation of materials and products, the study is predicated on the desire to maintain or enhance the activities of the salvage sector and involve community organizations and other entrepreneurs recovering materials from the waste stream. As the State of New Jersey closes its landfills for environmental reasons, other options for waste management must be sought. Reclamation alternatives are possible because materials kept out of landfills have value when they are processed.

Plans to allow for recycling are already underway. The waste-burning Energy Recovery Facility (ERF) to be located in the City of Newark has been downsized from original plans: it is the position of the City of Newark, the County of Essex, and the Port Authority of New York and New Jersey that removing recyclable materials prior to burning will improve the plant's operation. Recycling and similar waste utilization enterprises provide opportunity for economic development while decreasing the costs of solid waste management. Among the potential benefits are business development, job opportunities, energy and natural resources conservation, and environmental protection.

Other objectives of the study are to increase the business community's understanding of the benefits associated with recycling and waste utilization, evaluate and recommend supportive institutional arrangements, and promote cooperative development of the public and private sector.

**TABLE 1-1**  
**CITY OF NEWARK - DISPOSAL COST**  
**ALL SOLID WASTE [COMPACTED AND UNCOMPACTED]**  
**DISPOSED BY THE CITY AND ITS CONTRACTOR**



YEAR	DISPOSED BY PRIVATE CONTRACTOR		DISPOSED BY THE CITY		TOTAL DISPOSED	
	CUBIC YARDS	COST	CUBIC YARDS	COST	CUBIC YARDS	COST
1979	75,110	\$ 57,344	547,946	\$ 426,933	623,056	\$ 484,276
1980	146,398	\$109,799	453,455	\$ 340,091	599,853	\$ 449,890
1981	128,643	\$162,106	422,664	\$ 525,951	551,307	\$ 688,057
1982	138,144	\$401,617	506,911	\$ 732,589	645,055	\$1,134,206
1983	134,152	\$287,086	528,998	\$1,132,056	663,150	\$1,419,142
1984	125,099	\$518,313	526,976	\$2,323,492	652,075	\$2,841,805
1985	131,042	\$724,663	576,107	\$2,500,540	707,149	\$3,225,203
1986	(Projected)				750,000	\$4,375,000

## 1.2 PROJECT TASKS

This document was prepared according to bid specifications developed by the City of Newark, listed below. The specifications required the study team to:

1. Review the history of waste utilization in Newark
2. Review and diagnose the institutional arrangements in Newark
3. Discuss waste utilization methods applicable to Newark
4. Identify possible individuals, corporations, civic organizations, and government agencies that should participate in such programs
5. Outline technical considerations and methods to enhance program development
6. Make recommendations for the City of Newark considering the goals of the State of New Jersey and Essex County

## 1.3 PROJECT METHODOLOGY

Self-Reliance, Inc. has approached recycling development in an interactive manner. To build a consensus among citizens, community groups, government, and the business community toward one or more recycling goals, the contractor believes that a sense of commitment to those recycling "targets of opportunity," must be established.

First, representatives of Self-Reliance Inc. met with the client to clearly define the needs and desires of the City of Newark and its citizens. Through a process of elimination, they identified potential technological options; and they compiled background information, identifying key actors to be contacted for their support.

Second, SRI compiled a contact list for investigating marketing information, institutional conditions, supply data, and financing options. The contact list contained over 300 individuals representing businesses, government, and institutions to be contacted either by personal interview or by phone.

Third, SRI prepared an "Action Itinerary" (AI) to guide study team members through a weeklong site visit. The team director scheduled personal visits with promising markets and key Newark decision makers. Telephone interviews were conducted with markets and supply sources of the Newark area first, and with those of the Essex County-New York area second. The agenda also defined a number of tasks: profiling Newark's reclamation industry; evaluating markets in Newark; preparing a plan for a buyback collection center network in Newark; and, finally, developing a strategy for market development based on (1) offering local industry an opportunity to buy local feedstocks, (2) building on the successes of existing industries, (3) shipping materials generated within the City to existing markets either inside or outside of the City itself, and (4) formulating plans for developing new end-use waste utilization industries.

Finally, the contractor and the City's recycling staff reduced and interpreted the data to produce the waste utilization study report.

## 1.4 PHILOSOPHICAL ORIENTATION: THE CONCEPT OF URBAN SELF- RELIANCE

American cities are dangerously dependent. Like developing nations, they spend billions of dollars to import energy, food, raw materials, and finished products. Money earned in cities flows out of their borders to absentee owners of land, buildings, factories, to nonresident employees, and to higher levels of government.

Local resources are inefficiently used or managed. Valuable raw materials such as refuse are buried or burned at a net cost to the cities. The productive capacities of youth, elderly, and the unemployed are underutilized.



Cities and neighborhoods, even the poorest ones, have wealth. The goal of local self-reliance is to put this wealth to work and to keep the benefits in the cities. The self-reliant city extracts the maximum value from its raw materials, its technologies, its buildings, and its people. It emphasizes production and efficient use of resources over consumption. It relies on many locally owned small businesses rather than on one or two factories owned by remote corporations. Its development plans and policies are integrated to promote self-reliance.

By using the products and wastes of one process as the raw materials for others, the self-reliant city is able to retain and to harness the value added by each stage of processing or manufacturing. For example, it costs about a penny to dispose of an aluminum can. Recycled, aluminum cans are worth 20 to 30 percent more. Shredded, baled, or otherwise packed, their value increases by 45 percent; and smelted into ingots, the value increases by more than 50 percent. Fabricated into storm-window frames, the value increases over one hundred percent. Each addition of value increases jobs and income.

Local self-reliance stimulates initiative and gives self-confidence to citizens. In the self-reliant city, citizenship means active participation. Citizens are not only consumers, but also producers of wealth and managers of a city's future.

## **1.5 KEY CONCEPTS**

No recycling scheme exists nationwide; and in seeking to develop waste utilization and recycling practices, the recycler must compete with two powerful forces: the disposal ethic and virgin materials manufacturing. The "quick and easy" disposal system acts as a disincentive to recycling. The recycler must first confront the garbage establishment and the century-old emphasis on mixed-waste collection and disposal to have materials with which to work. Secondly, the recycler must compete with the more powerful virgin materials industry.

### **1.5.1 Solid Waste Disposal Theory**

The current paradigm of solid waste management evolved from the realization of turn-of-the-century public health experts that waste was the cause of disease and other problems. To solve the health problem, cities increased the frequency of waste pickups, minimized human handling, and either destroyed garbage by incineration or encapsulated it by landfilling. While addressing immediate concerns, sanitation-based waste disposal has created long-range problems recognized only recently.<sup>1</sup>

As disposal problems, such as closing landfills, occur, society finds it difficult to rethink this sanitation paradigm. Mixed material collection is assumed. Increased costs have made waste disposal expenditures paramount in municipal budgets. Maintaining this system, which relies on increasingly complex and costly technology, decreases or even destroys the value of the disposed materials. Once mixed, the materials become contaminated, damaged, or simply lost. Consequently, only the most pure and uncontaminated wastes -- that is, the most economical -- are recovered, and the much larger balance (approximately 90 percent in Newark) is discarded.<sup>2</sup>

### **1.5.2 The Virgin Materials Industry**

The virgin materials industry presents a powerful obstacle to the secondary materials industry for several reasons. First, the virgin materials industry is growing at a faster rate and working from a broader base than the secondary materials industry. Secondly, the virgin materials industry has huge capital and resource commitments to the continued (and expanding) consumption of raw materials and is encouraged to continue this practice by federal capital gains and depletion allowances. Such tax incentives increase the profitability of raw materials exploitation, while the difference in profitability between secondary and primary materials is not great enough to attract capitalization to secondary materials capacity.<sup>3</sup>

Moreover, the virgin materials industry, unlike most recycling industries, is vertically integrated. That is, the same corporation, or mother company and subsidiaries, does everything from mining the

raw materials to distributing the finished consumer articles. In this way, the corporation is able to internalize costs.

Thus, the recycler competes for materials under a system that reinforces sanitation over reclamation and favors the use of virgin materials over secondary ones. Furthermore, the secondary materials industry allows itself to be an adjunct to the virgin materials industry by focusing on materials that are either a partial substitute for virgin raw material or a substitute for some lower value product. Reuse, remanufacture, and whole-product recycling, which are independent of the virgin materials industry, are no longer considered viable enterprises. Recycling for only material or elemental value severely restricts opportunities to those industries able and willing to accommodate large volumes of secondary materials.

While overcoming these obstacles is a formidable task, the environmental and economic dilemma presented by the solid waste crisis is undeniable. Recycling was a prominent activity in the country through the 1940's. Institutional changes in recent years have resulted in reduced recycling levels and in a focus on materials over products, that is, on extraction of basic materials after collection over source separation of higher value products. The present system favors expensive, centralized technologies over more labor-intensive, decentralized techniques.

However, institutional development reoriented toward recycling can significantly change and improve the present situation regarding waste disposal. With no "quick fix" solution available, recycling promises to be one element of integrated waste management and can help recapture some of the economic independence now lost to cities such as Newark.<sup>4</sup>

### 1.5.3 The Hierarchy of Reclamation

The hierarchy of reclamation alternatives is established with the goal of maintaining or retrieving the value of the original product and maximizing both waste stream diversion and economic benefits for the City of Newark.

According to Dr. Robert Lund of the Massachusetts Institute of Technology, each stage of the hierarchy "represents a different level of cost to recover a given amount of financial value in the product after it has been used."<sup>5</sup> He lists four reclamation alternatives, from highest to lowest priority: repair, reuse, remanufacture, and recycling.

**Repair**, logically, represents the first recourse in the event a product malfunctions. **Reuse** through sale, barter, or give-away retains product value at low additional cost. Reuse enterprises range from the resale of used consumer items -- through ads, posters, yard sales, and flea markets -- to thrift shops, repair shops, and repair services. With a number of thrift, tire, and repair shops already located throughout Newark, this option is already a functioning element of the City's economy.

When repair or reuse of a product is no longer financially attractive, **remanufacture** may occur. Remanufacturing is the reassembly of worn-out parts of a durable product. The highest value element, called the core, is restored to "like new" condition, and the product reassembled of parts both old and new is sold as a new product at up to 40 percent less cost for the consumer than an equivalent brand new product.

Finally, when a product is disposed of, wears out, or becomes obsolete, **recycling** recovers the value of the material components, diverting this material from the landfills.

Waste utilization enterprises may fall into one or more reclamation levels. Especially useful during planning stages, the hierarchical relationships identify the economic and environmental benefits of the "higher" use options. Higher use options must be explored and exhausted before a next lower use is considered. This is important because "lower" uses preclude higher ones. Once paper has been burned, it can no longer have its fibers recycled. Once a car radiator is reduced to copper ingot, it can no longer be a remanufactured radiator.<sup>6</sup>

## 1.6 CONCLUSION

This chapter has presented the background rationale and methodology for producing this study. The balance of this report is concerned with factual information and projections for the future upon which to base Newark's recycling and reclamation strategy.

# **CITY OF NEWARK OFFICE OF RECYCLING**

## **SOLID WASTE UTILIZATION STUDY**

### **CHAPTER 2: HISTORY OF WASTE UTILIZATION IN NEWARK**

#### **2.1 WASTE UTILIZATION: A BRIEF HISTORY**

Newark is the third oldest major city in the United States, founded by Puritan families in 1666. The City's principal growth industries, leather tanneries, beer, paint, food processing, clothing and shoes, have traditionally been organized for reclamation with the familiar "ragman" an important element. The industries enabled incoming immigrants to enter mainstream economic society through recycling and scavenging.<sup>7</sup>

However, as the City swelled from a population of less than 20,000 in 1836 to over a quarter million by 1900, sanitation problems also grew. As in other places, sanitarians, including early environmental reformers such as Jane Adams, organized for municipal aesthetics. While sanitation improved, recycling became less important.<sup>8</sup>

The growth of the salvage sector continued until the Great Depression of the 1930's; since World War II, the traditional salvage, or reclamation, industry has become increasingly centralized and mechanized because of the increased cost of labor, environmental efforts to close down "smokestack industries" in urban areas, and the diversion of secondary commodities from local demand to the greater demand in export.

In particular, export markets require the centralization to manage high volume and extensive transportation. Typically, two or three salvagers dominate each commodity area, and they are usually conglomerates of salvagers and manufacturers. For example, Newark Boxboard has evolved into the Newark Group, Inc., made up of scrap dealers, packers, and mills, and exporting recycled cardboard to other regions of the United States.

Because of its proximity to other cities, its port facilities, and its manufacturing character, Newark is a hub for recycling. Not only do conglomerates form out of the reclamation and manufacturing sectors, but local industries also purchase and use or broker large quantities of recyclable materials, including glass, paper, steel, aluminum, and a number of other material substances. For the local scavenger the most viable markets are local: almost all salvageables ultimately travel to or through the City. Since dealers outside the City must pass materials through Newark, they can never offer as high a price for recyclables as Newark-based businesses. This is especially true for ferrous and certain nonferrous metals, and for corrugated cardboard, all of which are exported (See Appendix 5).

Thus, in spite of the trend towards centralization, Newark's advantage for recycling already allows a diverse reclamation sector to exist. In 1983, 95 operations, ranging from tire repair shops to oil collection stations to scrap yards, registered with the City of Newark as junk dealers and junk yards.

Those registered do not include the scavengers who rummage through refuse containers. Although their activity levels dropped in the early part of the century because of changes in attitudes as well as in waste collection methods, scavenging has greatly increased in recent years because of both risen unemployment (especially since 1974's energy crisis) and renewed interest in recycling.

Garden State Paper Co. has a newspaper collection station in Newark. Reynolds Aluminum operated a mobile recycling van that paid for materials until 1984. Alumet, Inc., a secondary aluminum smelter, set up a plant in Newark that helped raise the price and demand for locally generated aluminum scrap.

More recently, Newark's recycling staff has encouraged various activities throughout the City involving industry participation.

Alcoa Aluminum Company recently helped finance The Orchard Street Association in the opening of an aluminum buyback recycling center; Alcoa also opened its own operation in the City's North Ward. Five other community organizations have indicated their interest in operating buyback centers.

Glass Cycle Systems of Butler, New Jersey, has set up 20 glass recovery systems in bars in Newark. The company uses small in-bar glass crushers to save on space requirements and improve collection efficiencies.

The Rutgers-Newark Urban Gardening Program has been overseeing a reclamation program utilizing spent diatomaceous earth, a beer by-product from Anheuser-Busch, as a soil amendment in the city's gardens. Anheuser also provided a \$2,000 grant to develop a pilot grass/wildflower project to reclaim barren undeveloped lots in the City. If successful, over 70 cubic yards of material slated for weekly landfilling would be available for a possible compost and a citywide greening project.

Anheuser-Busch is further involved in Newark's reclamation activities because of New York's returnable bottle law. The company is expanding its brewery facilities, packaging about 12 to 14 percent of its beer in refillable bottles. Another major brewer in the area buys back recarbonized, unwashed quart bottles from Distributors' Recycling Inc.'s (DRI) processing operation in Newark, which handles returnables from New York; and a brewer in upstate New York is test-marketing refillables on a wide scale in the northeastern United States.

For the most part, the scrap yards are situated in one area, the East Ward. This industrial zone is near major traffic and rail arteries and bordered by the Newark International Airport and the downtown area. While some salvagers have moved out, the area is being developed. Besides DRI's unique operation, BASR Industries is conducting much labor-intensive grading of plastics, electronic scrap, and metals for local use and export (see Appendix 5).

## **2.2 RECYCLING ENDEAVORS BY THE CITY OF NEWARK**

The City's previous involvement in recycling has taken the form of support for private ventures that promised public benefits. Among the City's greatest efforts were the Recycled Material Procurement Policy, a composting project, and generous support of a major quasipublic recycling venture (Newark Recycling, Inc.); and the City supported two other waste utilization projects: the production of fireplace logs from leaves, and tire recycling. While all of these endeavors eventually failed, they provide valuable experience on which to base renewed efforts.

### **2.2.1 Recycled Materials Procurement Policy**

In 1972 the Municipal Council passed the Recycled Materials Procurement Policy, by which the City government would purchase items comprised of, in whole or in part, recycled materials. The Policy was not implemented, however, because of resistance from the primary materials industry: the vendor supplying paper for the City's copy machines claimed that recycled paper would invalidate the warranty on the machines. The City chose not to pursue the procurement of recycled paper for the machines and other materials as well. (Recycled paper of the early 1970's posed flaking problems that have been resolved.)<sup>9</sup>

### **2.2.2 Herbert Place Composting Project**

The Herbert Place Composting Project was a short-lived cooperative venture of the City of Newark and The Urban Gardening Program in the late 1970's. The project was to be located on an empty lot, which was prone to illegal dumping. Although the site was cleared of debris and litter, illegal dumping persisted throughout the leaf deposition period. A number of fires were set. After several weeks, the project was abandoned. After evaluating the problems associated with the project, the City has secured a more suitable location for reestablishing a compost project.

### 2.2.3 Newark Recycling, Inc. (NRI)

Newark Recycling, Inc. (NRI) evolved from a City-run program. Employing ex-offenders, the program sought to "recycle people" into the mainstream of life while conserving resources by recycling materials. As more ambitious attempts for curbside collection and postconsumer recycling failed, the operation moved into collecting high-grade papers. In 1978, about three years after its start, the program was incorporated as the nonprofit NRI to overcome obstacles to its marketing strategies. When subsidies dwindled between 1980 and 1983, the program suffered financial losses and went into debt. Recognizing the need to become a regular business, Newark Recycling, Inc. reorganized to absolve the debt. A devastating fire, however, in 1983 interrupted these plans for transition, and the organization dissolved in bankruptcy the same year.

## 2.3 KEY CONCEPTS

The common lesson in each of these early ventures is the need to understand the realities of salvage practices and the place of the salvage sector in the manufacturing chain. In particular, the demise of Newark Recycling, Inc. demonstrates the delicate position of the City government. When NRI closed shop, the salvage community considered it a typical example of government involvement in private industry, with unfair benefits and major competitive edge given to the government-sponsored project. For a time after the project dissolution, it was feared that the experience, especially the NRI bankruptcy, would be considered an embarrassment by the corporations involved and would discourage those and other corporations from supporting future City efforts. Fortunately, this is not the case; corporations appear increasingly willing to support recycling in Newark. Despite NRI's demise, the project demonstrated how large a recycling venture could become once a corporate/governmental consensus forms. Nevertheless, the City's experiences during the last 15 years have proven the need for supporting institutional development.

# **CITY OF NEWARK OFFICE OF RECYCLING**

## **SOLID WASTE UTILIZATION STUDY**

### **CHAPTER 3: ANALYSIS OF WASTE MANAGEMENT INSTITUTIONS AFFECTING NEWARK**

#### **3.1 BACKGROUND: SOLID WASTE MANAGEMENT AND RECYCLING IN NEW JERSEY**

In New Jersey, the Solid Waste Management Act (Chapter 1E of the New Jersey State Statutes, (P.L. 1975, C 326)) provides for the creation of 22 Solid Waste Management Districts, each of which is required to formulate a Solid Waste Management Plan, create an Advisory Committee, and review all municipal solid waste collection and disposal plans. In conjunction with its District plan, each municipality is responsible for its solid waste disposal. And, among the requirements for the management plans, a statement of policy must include the "maximum practicable use of resource recovery (defined as recycling) and energy recovery."

A portion of the Solid Waste Management Act is the New Jersey Recycling Act (N.J.S.A. 13:1E-92 to 96; P.L. 1981, c 278). The Recycling Act implements a comprehensive statewide recycling plan financed by a tax of \$.12 per cubic yard on landfilled solid waste. The fund created by the surcharge is used to implement the Act, which sets a recycling goal of 25 percent of municipal solid waste by 1986.

Essex County, the designated Solid Waste Management District for Newark, released its Solid Waste Plan in July 1979. Selecting alternatives among the "state-of-the-art" resource recovery alternatives, the plan recommended construction of a waste-to-energy facility, called an "Energy Recovery Facility" (ERF), and implementation of source separation and other waste reduction and recycling strategies.

More defined goals for source separation appeared in a 1983 study, *The Integration of Energy and Material Recovery in the Essex County Solid Waste Management Program*, which concluded that a Materials Recovery Facility (MRF) and the recycling of at least 15 percent of the County's waste (which is roughly equivalent to 25 percent of the County's municipal solid waste) would allow the Energy Recovery Facility to be downsized. Based on its findings that removal of all but "negligible quantities" of glass, metal, and newsprint would increase combustion efficiency and energy production, the study recommended a 25-percent recycling target for municipal solid waste. With the concomitant 15-percent downsizing of the energy recovery plant, substantial savings would be met in construction costs. Furthermore, the study recommended that a comprehensive materials recovery program would add many associated economic and environmental benefits.

With the state and county guidelines, Newark manages and pays for its garbage collection and disposal. The City-owned "Oak Island" landfill reached capacity and was closed in the mid-1970's. Solid Waste has since been landfilled in the Hackensack Meadowlands. In 1975 the City issued a report, "Solid Waste Disposal -- A Plan Of Action," and later solicited bids for the construction of a waste-to-energy facility. The selected vendor, Combustion Equipment Associates (CEA), declared bankruptcy before the facility could be constructed. The City has since deferred to the plan to construct a waste-to-energy facility with the Port Authority of New York/New Jersey and the County of Essex.

As the cost of solid waste disposal has continued to escalate, recycling and other waste reduction strategies have become increasingly attractive for their ability to reduce overall system costs. The City has adopted legislation and begun to develop a political and administrative infrastructure to accomplish the changes necessary for waste disposal.

## 3.2 THE LARGER INFRASTRUCTURE

### 3.2.1 State and Regional Agencies

#### *New Jersey Office of Recycling*

The New Jersey Office of Recycling was created, at the same time as and because of the New Jersey Recycling Act (P.L. 1981, C.278), to administer a series of grant programs aimed at diverting 25 percent of the State's Municipal Solid Waste Stream by 1986.

#### *The Board of Public Utilities*

The Board of Public Utilities (BPU) economically regulates the solid waste and disposal industry in New Jersey, since all directly billed waste contracts are considered to be utilities. BPU regulation covers private haulers contracting directly with both commercial and residential customers.

Businesses may be charged a rate per customer, per pull, per container, or per month. Where the charge is related to volume, direct benefit will be gained by volume reduction through recycling. Where the charge is per month, and BPU regulated, there is no economic incentive to the resident or business to recycle, as their rates are fixed and cannot be reduced.

#### *Division of Solid Waste Management*

The Division of Solid Waste Management is organized under the Department of Environmental Protection to promulgate and enforce rules and regulations, as empowered by Title 13:1E et seq. of the New Jersey State Statutes (Solid Waste Act, PL 1975, C.326). The Division has the power to permit landfills and composting facilities, and to regulate refuse haulers.

#### *The Port Authority of New York and New Jersey*

The Port Authority of New York and New Jersey (PA) is a bi-state agency, whose actions are governed by the Board of Directors appointed by the governors of New York and New Jersey. The Authority is responsible for managing and operating a number of facilities located within the Port area, considered to include anything lying within a 25-mile radius of the World Trade Centers. Although chiefly concerned with roads, bridges, train and bus terminals, airports, and other components of the transportation network, the Port Authority is also mandated to maintain and enhance the economic viability of the Port service area through economic development and industrial redevelopment.

The Port Authority first became interested in solid waste as part of a search for low-cost energy for industrial use (hoping that refuse-derived energy would provide electricity and steam for industries in the port area). Even when it became clear that refuse-derived energy would be more expensive than expected, the Port Authority came to understand that long-term disposal issues in the densely populated metropolitan area seriously affect the long-term viability of the region: hence, the Authority's interest in resource recovery.

Upon publication in 1979 of Essex County Solid Waste Management Plan, the City of Newark, Essex County, and the Port Authority began to work together developing an Energy Recovery plant in Newark. The Port Authority's official role in the project is as "Project Developer." Essex County is the "Project Sponsor." The Port Authority's responsibilities as developer include:

- o Technology evaluation
- o Vendor selection
- o Procurement

The Port Authority has also been involved with financing and designing the Energy Recovery Facility (ERF), and subsequently, with developing the Materials Recovery Facility (MRF). The Port Authority interest in economic development may also involve it in recycling industry market development in and around Newark, in the opinion of the County Recycling Program Manager.



### 3.2.2. Current, Pending, and Anticipated Legislation

A number of legislative initiatives are pending as amendments to the State Solid Waste Management Act, N.J.S.A. 13:1E1 et.seq. If passed, several of those would affect recycling in Newark.

#### *Beverage Container Deposit Legislation*

During the Fall of 1983, the New Jersey Assembly released a bill, modeled on similar provisions enacted in nine other states, requiring deposits on all carbonated beverages. The "Bottle Bill" would significantly increase the amount of beverage containers recycled and may alter the context for developing recycling programs, especially buyback centers, in Newark. Such centers may have to evolve into redemption centers to redeem deposits on returned containers (see Appendix 8).

#### *Amendments to the Solid Waste Law*

**Mandatory Recycling:** Legislation currently being drafted by the Department of Environmental Protection (DEP), in conjunction with the Recycling Advisory Committee of the New Jersey Recycling Forum, would make recycling mandatory in the state within two years. This legislation, introduced in early spring of 1985, should be examined closely for possible impacts on Newark's plans.

### 3.2.3 County Agencies

#### *Essex County Department of Planning and Economic Development*

N.J.S.A 13:1E1 et. seq. of the New Jersey Solid Waste Management Act empowers the county Board of Chosen Freeholders to designate an agency to develop and implement a solid waste management plan for the Essex County Solid Waste Management District. The responsibilities of the Freeholders are:

- o To designate an agency to be responsible for solid waste in the County
- o To approve the plan developed by that agency
- o To approve any and all plan modifications

The Board of Chosen Freeholders of Essex County designated the Essex County Department of Planning and Economic Development as the agency responsible for solid waste. That responsibility includes:

- o Developing a plan (completed in 1979) for long-term solid waste management
- o Implementing the plan
- o Modifying the plan

The basic elements of the Essex County Solid Waste Management Plan include:

- o Construction of a 2,100 TPD waste-to-energy plant
- o Securing backup landfills
- o Assuring interim landfill capability
- o Recycling 15 percent of the County's waste

Additional responsibilities of the Department are:

- o Reviewing applications for solid waste facilities, including transfer stations, compost facilities, and solid waste disposal facilities

- o Reviewing all municipal contracts with waste haulers for compliance with the County plan
- o Reviewing recycling contracts when requested
- o Technical assistance to all recycling programs
- o Assuring compatibility of waste disposal and recycling activities

Pursuant to the 1979 plan, the 1980 modifications, and the 1983 Study of Integration of Energy and Material Recovery, the County's recommendations for solid waste management in Newark are:

1. Pass a mandatory separation ordinance, restricting residents from mixing glass, newsprint, cans, and corrugated with their garbage.
2. Implement a network of urban buyback centers.
3. Site a Materials Recovery Facility (MRF) adjacent to the Energy Facility (ERF).
4. Direct as much material as possible to existing scrap dealers.
5. Recover dry commercial waste, by providing curbside collection for small commercial enterprises.
6. Recover dry commercial waste by high-grading homogeneous loads.
7. Compost leaves from street trees.
8. Engage in vigorous public education both in schools and in the community, informing citizens how and why they should recycle.

Although the Integration Study recommends passing antiscavenging ordinances where curbside collection is planned, the County Recycling Program Manager does not actually recommend such ordinances for Newark, where scavenger activity is essential to waste reduction.

The relevant documents containing the county's solid waste information are listed in the bibliography of this document (see Appendix 2).

### *The Essex County Solid Waste Advisory Committee*

As part of the planning process, the New Jersey Solid Waste Management Act required the county to consult with a Solid Waste Advisory Committee formed of municipal representatives. The advisory committee has continually played a role in solid waste planning and implementation, and serves as a liaison between county and individual municipalities within the county. Newark's representative on the committee is the Chief of Program Planning and Project Execution, in the Newark Department of Engineering, who supervises the recycling staff. At least one recycling staff person also attends all advisory committee meetings. Subcommittees of the Advisory Committee include both an Energy Recovery Committee and a Recycling Committee.

### 3.2.4 County Ordinances

The amended Essex County Ordinance 00220 effectively bans recyclables from the proposed Energy Recovery Facility by refusing wastes containing "more than negligible amounts of recyclables." The policy also prohibits "any attempt to preclude expansion of recycling to maximum levels" by waste flow agreement or other measure.

### 3.3 ELECTED CITY OFFICIALS, CITY AGENCIES, AND CITY ORDINANCES

#### 3.3.1 Elected City Officials

Newark has ten elected City officials: the Mayor, one Council member for each of five wards plus four Council members elected at large. The Municipal Council approves the City budget, contracts, ordinances, and resolutions in conjunction with action by the Mayor's office.

Since 1970 the City Administration has supported recycling, establishing the Office of Recycling and providing the initial infrastructure for coordinating recycling with waste disposal and collection throughout the City.

Over the years, the Municipal Council has passed a number of resolutions regarding recycling. Some, passed in the early 1970's, had to do with projects now abandoned or defunct (Recycled Materials Procurement Policy and resolutions concerning Newark Recycling, Inc. These programs were discussed in Chapter Two.) Other resolutions are mentioned below.

- o Resolution #7Res, 8/11/82, endorses the concept of mandatory container deposit legislation (see Appendix 8).
- o Resolutions 7RF, 10/20/82, and 7RV, 2/15/84, ratify submission of grant proposals to the New Jersey Office of Recycling.
- o Ordinance #6S&FP, 1/4/84, creates the position of Recycling Coordinator.
- o Resolution #7RL, 10/9/83, contracts for the Waste Utilization Study.

#### 3.3.2 City Agencies

The agencies described in the following sections relate to three broad categories: (1) solid waste management and litter control; (2) planning, economic development, and financing options for recycling activities; and (3) education, public information, and outreach. At this time, the new Mayor, **Sharpe James**, who was elected in 1986, and his administration are reorganizing the City departments; however, the broad categories affecting recycling are valid from the information gathered by this study.

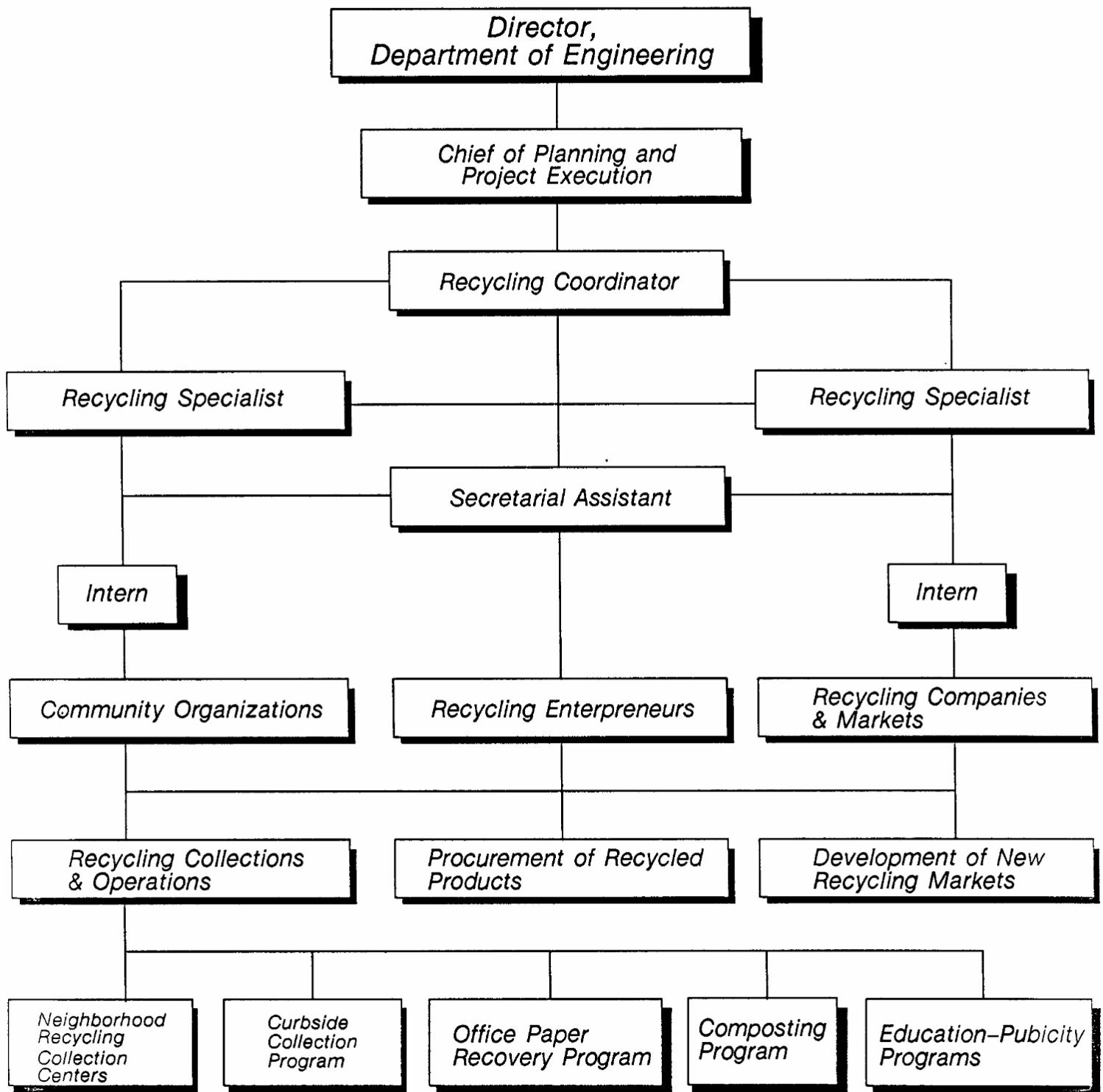
The following sections present a general description of City agencies whose activities bear on solid waste management, specifically recycling.

##### *Solid Waste Management and Litter Control*

The principal City agency for solid waste management and recycling is the Department of Engineering. As a whole, the Department of Engineering has consistently been an advocate for innovative forms of waste management including recycling. The Director of Engineering heads the Department, and four divisions, Engineering and Contracts Administration, Water/Sewer Utility, Traffic and Signals, and Sanitation, answer to the Director.

The Office of Environmental Services (OES), a new section of the Department of Engineering (see Table 3-1), has played an important role in recycling and solid waste management development. The City is represented by OES on the Essex County Solid Waste Advisory Council (SWAC), on the New Jersey Recycling Forum, and on Love Newark Keep It Clean, a litter abatement committee for Newark. Additionally, OES staff have applied to the State Office of Recycling on behalf of the City for reimbursement of landfill surcharges through the municipal tonnage grant program (see Appendix 3); developed bid specifications for leaf composting, leaf log procurement, and separate collection of recyclables; and amended the City's refuse collection ordinance, Title 13A, which is discussed below. The Office of Environmental Services has also promoted recycling through support for private and community-oriented reclamation efforts.

TABLE 3-1  
CITY OF NEWARK  
OFFICE OF RECYCLING  
ORGANIZATION CHART



Other City agencies besides the Department of Engineering affect recycling and its development. The Department of Development operates and manages City-owned properties. The City initiated an "adopt a lot" program to lease City-owned properties to City residents or nonprofit organizations for use of the properties in a manner consistent with City objectives.

The Division of Parks and Grounds and the Division of Motors maintain the City's parks and grounds and fleet of vehicles, respectively. The Office of the Business Administrator is responsible for purchasing for the City. The Division of Central Purchase, within the Office of the Business Administrator, buys supplies and materials for all municipal departments.

### *Planning, Economic Development, and Financing*

Several agencies were involved with both formal and informal planning for the City at the time this study was prepared. As part of the formal planning process, a Central Planning Board exists supported by a staff of professional planners. The Office of Planning and Grantsmanship (P&G), which was formed to make use of federal and state funds, carried out much of the City's planning. P&G also provided planning services for the City through its Transportation, Capital Budget, and Economic Development Units.

The Newark Urban Gardening Program has worked with the Administration on a variety of different projects, and today their program has helped to create over 600 gardening sites in the City. Unlike the greening project, the Newark Urban Gardening Program is well coordinated and seeks to develop specific approaches and opportunities to involve everyone. The "Love Newark...Keep it Clean" campaign is also enormously successful following a similar organizational model. Both of these successful programs are discussed in greater depth in other parts of this chapter.

### *Education and Public Information*

Educating, or reeducating, our society to consider recycling as an integral part of waste disposal should be a top priority in any overall recycling scheme.

In Newark, the Board of Education (BOE), has developed a rudimentary curriculum on the topic of litter abatement which makes reference to recycling. There is no formal mechanism for schools to develop on-site recycling projects. No recycled products are yet purchased, although the Board can entertain bids for the purchase of products containing recycled materials.

The Newark Museum provides for cultural and informational exchange among the diverse members of the Newark community. In the past the museum has sponsored an energy conservation exhibit; and this study team, in its interview, found the museum staff interested in sponsoring a recycling exhibit.

The "Love Newark...Keep it Clean" Program is an independent corporate committee, with representatives from the City government, Chamber of Commerce, community organizations, and major corporations. Two of its members are also staff of Newark's Recycling Program, and they initiate many projects. The "Love Newark..." program has been hailed nationally for getting the antilitter message to the public. Recycling is also part of the mission of the committee, although to date it has not pursued this activity aggressively.

The Office of Public Information (OPI) was part of the Mayor's Office, organizing media events, newspaper stories for the **Newark Star Ledger**, and a public information program, "Newark and Reality," for WOR-TV and WPEK-FM public radio. In the past, the Office of Public Information produced TV programs on tire recycling and recycling aluminum with similar programs on WPEK-FM.

### **3.3.3 City Ordinances**

City Ordinances bearing significantly on solid waste management and recycling include Title 13A (Administration and Regulations of Solid Waste) and Title 8, Chapter 8 (Junk Shops, Junkyards and Metal Processing Facilities). The following aspects of each provision represent significant barriers to recycling and waste utilization.

Title 13A: Adopted in May 1982, this ordinance represents the part of the City's Solid Waste Code encompassing solid waste disposal, recycling, and litter abatement. Among the relevant provisions are:

- o "Persons desiring to engage in the business of private collection of solid wastes (i.e., wastes, refuse, recyclables) must apply for a license" [13A: 4-4 and 13A:5-1(a)].
- o Licensees must pay an annual fee of \$20 to operate.
- o It is unlawful for an unauthorized collector to collect or otherwise disturb wastes (or recyclables) placed at a curb in the City.
- o Informal collection is constrained to those times when refuse is regularly collected.
- o Sources are not permitted to place wastes (or recyclables) at curbside except on days of regular collection.
- o City employees or "agents" are prohibited from entering private premises or portion of any such premises for the purpose of moving waste (13A: 4-12).

Title 8, Chapter 8, of the Revised Ordinances of the City of Newark: This provision was revised as recently as 1980. The intent is to regulate junk shop or junkyard activities. Chapter 8, sections 1-21, sets forth a number of provisions, including the following:

- o Use of the word "junk" to describe recycling activities.
- o An applicant for a license must be a U.S. citizen and cannot be a pawnbroker (8:8-2).
- o Purchase of good articles or things (including recyclables) from minors is expressly prohibited (8:8-10).
- o The fee for a "junk shop" is \$50, that for a "junk dealer" with a vehicle is \$25, and that for a "junk dealer" on foot is \$15 (8:8-4; 8:8-18).
- o Operators of "junk shops" must post a bond of \$500 (8:8-5).

Both provisions regulate fees, one (Title 13A) for collecting discarded objects, the other (Chapter 8) for dealing (i.e., selling) those objects. Such a fee structure may not be equitable, in that no distinction in size of the various facilities in Newark is considered. However, the capacity to move recyclables is considered and charged accordingly; but the removal of wastes, refuse, and recyclables is restricted to certain times and places that may severely curtail the activities of the scavenger community.

### **3.4. THE NEWARK RECLAMATION SECTOR**

The Newark salvage and recycling sector, in its diversity, forms a private enterprise "institution" able to act rather cohesively because of its members' shared interests, competition, need, and finances. Industry supports community recycling programs by providing equipment and purchasing recyclables. Alcoa, for instance, provided mechanical can crushers and transportation of materials for Newark Recycling, Inc., and more recently, for the Orchard Street Buy-Back Recycling Center. Although the market (industry) subtracts the cost of the equipment from the purchase price of the recyclables, in most cases the market does bear the cost of equipment.

As has been mentioned, historical conditions have made the export of secondary materials the major focus of Newark's (and the whole country's) reclamation activities. Much of the reclamation industry activity in Newark relates to purchasing, processing, packing, and shipping secondary materials; to recover the costs of shipping, the businesses use materials with a high ratio of volume to value. Also to minimize its costs the reclamation sector has enhanced recycling. For example, Newark Boxboard reported activities to allow haulers to tip corrugated cardboard loads directly at their plant. And BASR Industries has expressed an interest in helping to manage any buyback center operation initiated by the City of Newark.

Today, few enterprises exist that recover, repair, reuse or remanufacture used products. It is extremely significant that an area brewery and a local recycling industry have jointly embarked on a used container return program. Successful application could point to a return to refillable glass containers for a number of products. The project is as yet a pilot; it involves the brewer washing the containers in the filling line, rather than the supplier washing them as part of the recasing process. Encore, a supplier in Emeryville, California, does conduct such a bottle-washing service for wineries and specialty bottlers, using solar energy to heat wash water.

### **3.5 VOLUNTEER ORGANIZATIONS AND VOLUNTARY GROUPS**

The private sector, for purposes of this study, includes churches, community organizations, schools, and specialty organizations. The study team met with a number of these, and the interviews are summarized below.

#### **3.5.1 Neighborhood Organizations**

The Newark Coalition for Neighborhoods represents its membership on such issues as economic development, crime fighting, education, and housing. The Coalition has seemed willing to expand its program and participate in citywide recycling. In December 1983 the organization attended a presentation on recycling development; and, one of its member organizations, Tri-Cities Citizens Union for Progress, has been considering a recycling center program for some time.

The study team met with the Islamic Center of Newark, whose representative had previously worked as plant manager for Newark Recycling, Inc. He expressed interest in recycling on behalf of the Islamic Center and identified other organizations he thought would also support recycling. Community based organizations are listed in Appendix 7.

#### **3.5.2 Other Organizations**

Rutgers University – Cook College has been developing technological applications in recycling. Through its Cooperative Extension Service, Rutgers has provided information on composting and technical assistance to municipalities, nonprofit groups, and private firms. One Extension activity, the Rutgers–Newark Urban Gardening Program, is in its sixth year under a grant from the U.S. Department of Agriculture. The Gardening Program's staff help City residents secure vacant lots and begin gardens. In its history the program has aided 1,500 residents at over 600 sites. In particular, the program loans tools and provides environmental education presentations in the schools and community training sessions encouraging self-sufficiency. Periodically the program secures seeds, compost, and other donations that it makes available on a first-come-first-served basis. The program also sponsors community events, including an annual harvest dinner and a tailgate farmer's market.

Metropolitan Ecumenical Ministries (MEM) represents five mainline Protestant denominations and is affiliated with the Catholic Archdiocese and the Newark–North Jersey Committee of Black Churchmen. The Ministries is reorganizing to better minister to the needs of the poor with food, shelter, housing, education, and ecumenical church programs. The Ministries supports the development of small businesses based on waste recycling enterprises that can benefit the poor.

The Greater Newark Chamber of Commerce, representing the business interests of greater Newark, advises the business sector on events and opportunities, such as export markets for small businesses. The Chamber of Commerce has also alerted business to solid waste issues including the proposed resource recovery plant in Newark and proposed container deposit legislation. During an interview, the Chamber of Commerce expressed interest in launching Newark's waste recycling enterprise development by sponsoring an entrepreneurial seminar on business opportunities and financing.

Renaissance Newark is a business community support group concentrating on rebuilding and refurbishing downtown Newark. The organization has, as one task, created office space in downtown Newark at lower cost than that available in New York City. Through Renaissance Newark's efforts, liberal tax abatements have lured firms to relocate to the metropolitan area.



Goodwill Industries and The United Way, both considered representative of their organizational types, were interviewed. Because of high labor costs and the difficulty in obtaining spare parts, Goodwill Industries has cut back on its traditional repair activities, concentrating on high-value items, clothing, and collectibles. However, the organization's local president was interested in any business development to renew repair activities.

United Way is the umbrella charitable organization for a number of greater Newark organizations. Monies raised by United Way are disbursed to these on the basis of need. According to Tom Guidry of United Way, the organization is interested in helping any structured program initiate recycling activities as part of revitalizing Newark's manufacturing sector.

### **3.6 KEY CONCEPTS**

With the guidelines set by the State of New Jersey and Essex County, and with the help of the Port Authority of New York/New Jersey, the City of Newark is developing a program, an infrastructure, and facilities for waste reduction through recycling. However, the City needs some overall public policy that integrates recycling with the relevant agencies responsible for trash collection, hauling fees and licenses, and education.

The reclamation sector is diverse and can accommodate local and export demands. Newark's private sector of church groups, neighborhood organizations, schools, and specialty organizations indicate that they will support recycling by operating buyback centers, by using and helping process compost for urban gardens, and by developing small businesses based on waste utilization.

### **3.7 CONCLUSION**

This chapter has reviewed and analyzed the public and private sectors as they relate to solid waste management and reclamation. It identified the State of New Jersey's Solid Waste Management Code (N.J.S.A. 13:1E et. al) as the context for solid waste management and recycling initiatives by City government. Relevant City and county ordinances and pending state legislation have been examined. The City's agencies and elected officials and the roles they have played in the past were presented and discussed. The chapter has also examined institutions, relationships, and measures either helpful or which serve as barriers to recycling and waste utilization enterprises. The salvage sector and neighborhood and other organizations were presented as institutions that may be critical to the development of waste utilization enterprises.

## CHAPTER 4: THE DYNAMICS OF SUPPLY AND DEMAND

### 4.1 INTRODUCTION

Waste utilization in Newark depends on identifying either accessible or as yet inaccessible supplies of recyclable materials, creating or enhancing the demand (market) for them, and establishing a collection and processing infrastructure to convey the supplies to the markets.

Where a supply of recycled material will dislocate a virgin material, that industry may seek to inhibit or prohibit acceptance of the recycled material. Downward price pressure from the soda ash and silica sand producers has retarded the use of cullet (scrap glass) in glass mills in the Northeast. Without this competition from virgin materials industries, cullet would be much more marketable. For instance, during the hard winter of 1979, glass mills that typically limit their cullet mix to 35 percent were using 100-percent cullet, which was available locally. Although the mills reverted to the 35-percent mix, which the industry claims is the "upper limit," the potential for increasing the ratio of cullet to that of raw soda and sand seems to exist.<sup>10</sup>

Frequently, demand may be enhanced by increased processing or better separation of the supply of recycled materials. Although the demand for mixed paper is weak, there is strong demand for pure ledger or pure newsprint. High-grading an unmarketable supply may allow the recycler to enter new or more advantageous markets.

Conversely, high-grading adds expense to the process of recycling that may not be recovered in the sale of the new commodity. Government, in its public policies, may be able to offset adverse marketing and manufacturing obstacles; and this study recommends a partnership of public and private sectors to make recycling feasible in the marketplace so that it can accomplish the stated goal of waste reduction.

This chapter furnishes data from this study's research and projected statistics on Newark's supply of recyclables in its waste stream and the specific demand (markets) for those materials. Chapter Five further identifies technological options to implement the City's waste utilization enterprises.

### 4.2 SUPPLY PROFILE

According to figures from 1980 and 1982 City of Newark Sanitation Reports and the Port Authority's 1980 Composition and Weight Study of Municipal Solid Waste, approximately 226,000 tons of waste are generated in Newark a year (see Appendix 3). Most of these materials are not available for recycling because they are heavily contaminated or occur as a segment of mixed waste, and thus they are not readily segregated. Nevertheless, the most readily available data on the actual and potential supply of recycled materials, presented in Tables 4-1 and 4-1A, come from scrutiny of Newark's waste stream.

The tonnages in Table 4-1 represent the integration of waste data from the City of Newark's 1982 Annual Report and a composition study conducted for the Port Authority of New York and New Jersey in that same year. The more recent data are Newark's 1985 solid waste figures, derived from the City's tabulation of volume of trash collected. According to figures from the City of Newark's collectors and contracted haulers (and not including private haulers), municipal solid waste for the City of Newark reached 707,149 cubic yards (559,768 cubic yards compacted and 147,381 cubic yards uncompacted) in 1985.

Based on a national per capita disposal rate of about 2.5 pounds per person per day and a population figure of 320,000 people for Newark, the estimated disposal quantity of household waste would be more likely 146,000 tons annually instead of the stated 161,264 tons. This is 64 percent instead of 72 percent of the wasteload. Based on these raw data and current market status, 32 percent of the waste stream is organic and has supply value for composting, 34 percent can be recycled, 27 percent represents burnables without market value, and 6.9 percent is inert fines.

The most readily identifiable supply items are:

- Compostables	76,016 tons/yr
- Old corrugated containers(OCC)	36,262 tons/yr
- Newspaper	13,244 tons/yr
- Glass	15,044 tons/yr
- Ferrous metals	8,466 tons/yr
- Aluminum	2,342 tons/yr

Additional characteristics of Newark's waste are:

- o As much as 25 percent of the organics may be contributed by the annual leaf fall, (i.e., 3 to 7 percent of the total waste stream. Leaf collection was being carefully monitored as this report neared completion.
- o Corrugated containers represent the second largest single item in the total waste stream. Paper stock dealers report that local corrugated material is being skimmed by waste haulers and sold to them. Baler manufacturers are reporting record sales, indicating that the private sector may be very active in the reclamation of corrugated goods.
- o Plastics are about 7 percent of the wasteload (by volume); they provide between 15,000 and 19,000 BTUs per pound.
- o The combined supply of glass, paper, ferrous, and aluminum represents 34 percent of the waste stream. An initial waste utilization strategy targeted at least 50 percent recovery of these materials to meet state and county recycling tonnage goals and save the City over \$1 million in waste disposal costs. (The City spent over \$3 million on waste disposal in 1985 and over \$4 million is projected for 1986) (see Appendix 3).

**TABLE 4-1. WASTE SUPPLY BY AGGREGATE VOLUME FOR NEWARK  
IN 1982**

Waste Type	RESIDENTIAL		COMMERCIAL		TOTAL SOLID WASTE	
	(%)	Tons	(%)	Tons	(%)	Tons
Organics	(34)	62,892.96	(14)	9,123.52	(32)	76,016.48
Corrugated	(14)	22,576.96	(21)	13,685.28	(16)	36,262.24
Wood	(1.25)	2,015.80	(26)	16,943.68	(8)	18,959.48
Glass	(8.25)	13,304.28	(3)	1,955.04	(7)	15,259.32
Plastic	(6.5)	10,482.16	(7)	4,561.76	(7)	15,043.92
Newspaper	(7)	11,288.48	(3)	1,955.04	(5)	13,243.52
Ferrous	(5.25)	8,466.36	(6)	3,910.08	(5)	12,376.44
Aluminum	(1.25)	2,015.80	(.5)	325.84	(1)	2,341.64
Fines	(6)	9,675.84	(5)	3,258.40	(6)	12,934.24
Misc.	(11.5)	18,545.36	(14.5)	9,449.39	(12)	27,994.72
Totals	(95.0)	161,264	(100)	65,168	(99)	226,432

**TABLE 4-1A. 1985 SOLID WASTE GENERATION BY WASTE TYPES (tons/year)\***

	Newark	Essex County. Total (including Newark)
Population	318,098**	836,528
Municipal	292,743***	663,028
Dry sewage sludge	391	446
Bulky	349,922	551,246
Vegetative	173	5,670
Animal food processing	442	1,593
Nonchemical industrial	16,974	18,179
Total	660,645****	1,240,212

\* Based on data from O&D (Origin & Destination) forms provided by HMDC.

\*\* Newark represents 38% of the population of Essex County (318,095 / 836,528).

\*\*\* City personnel and contractors working on behalf of the City collected 707,149 yds<sup>3</sup> of Municipal Solid Waste (MSW) in 1985 (707,149 yds<sup>3</sup>/3.3 yds<sup>3</sup>/ton = 214,288 tons of MSW or 73% of all "municipal" (type 10) waste originating in Newark. The amount of municipal (type 10) solid waste attributed to having originated in Newark (292,743 tons) represents 44% of type 10 waste generated in Essex County.

\*\*\*\* The total of all solid waste collected and disposed of from within the City of Newark represents 53% of the total solid waste collected and disposed of from within Essex County (660,645/1,240,212 = 53.3%).

### 4.3 SOURCES OF WASTE

In Table 4-1, waste is divided into residential "household" waste and commercial waste. The characteristics of each are quite different, and waste utilization efforts should address them differently.

#### 4.3.1 Residential Sources

The components of household refuse include wastepaper, metals, glass, organics, plastics, rubber, and repairables. Wastepaper includes newspaper, cardboard boxes, magazines, ledger, mail, tissues, towels, and packaging such as wrapping, bags, boxes, and containers. Metals are generally containers, although a variety of metal items, including furnishings, can be found. Glass is almost exclusively comprised of container glass. Organics are yard waste, leaves, textiles, wood, and food wastes. Plastics generally include packaging, appliance parts, textiles, and increasing amounts of furnishings. Tires, mattresses, and appliances are often present and comprise potential supplies of recyclables while newspapers, yard and food wastes, and aluminum are considered already existing supplies of residential wastes.

In the past, residents set aside recyclables for the scavenger or as a patriotic duty. Today, no such program exists. As a result, residents have become habitual mixers of wastes generated in different segments of their homes. Yard wastes, kitchen wastes, packaging, and general repair are lumped together; some are even compacted with small kitchen compactors. Mixed wastes, combined with the normally small volume of waste per generating unit and the number of stops required for collection, make separate collection of each type of recyclable both difficult and expensive.

### 4.3.2 Commercial Sources

A variety of commercial and industrial sources contribute waste to the municipal waste stream. Such sources frequently have homogeneous and readily available materials, for which a market already exists. In fact, a composition study performed for managers of Urban Ore -- a California-based firm specializing in material recovery from landfill high grading -- found that 80 percent of all trucks delivering mixed wastes to the Berkeley landfill contained no more than five categories of materials per load.<sup>11</sup>

Other industrial waste sources contribute items requiring processing to make them marketable. Such sources include bakeries, breweries, fabricators of durable goods, and food rendering plants.

Wood, corrugated, and organics comprise 61 percent of the commercial waste stream. While sources of these materials require greater investigation, observation by the Study Team indicates that the wood is generated by a number of manufacturing concerns from pallets and from demolition waste. Corrugated is generated by bars, and retail and department stores, and by warehouses in every ward of the city. Additional organic sources of waste are available from food processing industries based in Newark and from restaurants.

Offices provide most of the high-grade waste paper, which requires little processing to be recycled. However, this supply does require a sophisticated collection system. Factories frequently discard "home scrap," or other by-products of their processes. Where these are readily available for recycling, they may already be marketed, by either the generator or the waste hauler. Newark Disposal is one waste hauler that has realized the value of the recyclable material in the waste it picks up.

Usually a compactor or roll-off container of at least 30 cubic yards stores wastes for collection by a hauler. Where recyclables are skimmed, the recycler will either offer the generator some cash for temporarily storing valuables on the loading dock (with or without the acknowledgement of the building superintendent), or simply rummage through discards in open-top containers.

The key to successful recovery from commercial sources is regular, frequent, and inexpensive collection, with minimal inconvenience to the source generator. Either collecting large quantities at a single source or making regular rounds at several sources may be effective collection strategies.

## 4.4 EXISTING AND POTENTIAL DEMAND

To achieve significant levels of waste utilization, new markets will have to be opened up. The study team contacted a number of market sources, which are listed in Appendix 5.

Specific opportunities with those contacted are reviewed in Appendix 4. Some of the most promising markets are discussed in the following subsections, 4.4.1 and 4.4.2.

### 4.4.1 Domestic Demand

The materials with existing markets include newsprint, corrugated (OCC), wood, scrap glass (cullet), ferrous and nonferrous metals, reparable furniture and appliances, used crankcase oil, and used aluminum beverage containers (UBC). The well-developed markets for these items vary in their capacity to accept increased tonnages. The Market Guide developed by the New Jersey Office of Recycling addresses markets for cullet, UBC, newsprint, OCC, and some metals.

Several industries in the Newark area have the capacity to accept additional supplies. A list and short discussion of the businesses' specific attributes appear in Appendix 4.

### 4.4.2 Export Demand

Where local or domestic market demand is soft, Newark may increase waste utilization through export. Sometimes businesses that use or process for their own use also export materials and are

willing to serve as brokers. A fair number of businesses also exist for the sole purpose of purchasing recycled materials for export. The Port of Newark is one of the most active export areas in the country, and this holds great promise for waste utilization.

In a recent magazine article a Port Authority spokesman said, "'Our biggest export, believe it or not, is wastepaper...' In recent years, the world hasn't been able to afford much of what the U.S. creates but refuse."<sup>12</sup>

Export requires a certain amount of expertise. Elements of successful exporting include:

- Letters of credit
- Contacts with purchasers willing to pay shipping or purchase materials F.O.B. a U.S. port
- Ability to take financial risks
- A financial cushion, as payment frequently takes longer than promised
- Access to shipping at reasonable rates
- Patience: many overseas markets are reluctant to do business with anyone they do not know well
- Understanding mill specifications
- Reliable ability to meet mill specifications, to avoid being assessed a backhaul on rejected shipments

The City's best strategy for increasing material utilization through export probably entails working with existing exporters, taking advantage of their prior mill relationships and the price advantages that come from doing business in volume. Export brokers in the Newark area are listed in Appendix 4.

## **4.5 INTEGRATING SUPPLY AND DEMAND**

### **4.5.1 Meeting Existing Demand**

To better understand the market opportunities the study team surveyed markets in the Newark area. A digest of relevant market information is presented and discussed in Chapter Five, and Appendix 5 contains a complete list of market contacts.

Based on its research the study team recommends that short-term waste utilization activities concentrate on enlarging the supply of recyclables with two or more strong stable markets. Materials recommended for supply development are:

- ledger paper
- computer paper
- crankcase oil
- certain post-industrial plastic scrap
- OCC
- wood
- newsprint
- aluminum UBC
- ferrous scrap
- nonferrous scrap
- compost

Market acceptance for these materials, if they can meet mill specifications, seems ready and unlimited in the short term.

#### 4.5.2 Developing Demand for Target Materials

The study team also recommends developing **demand** for a number of waste items that do not currently have markets. Demand could be developed through export capability, through increased collection or processing capacity, or through actual creation of new uses. Materials for which demand development is a priority include:

- mixed paper
- food waste
- glass cullet
- tires
- demolition waste
- asphalt
- yard waste
- compost
- plastics (including PET UBC)
- magazines

Successful market development in these areas depends on extensive cooperation between the City's recycling staff and the responsible persons involved in economic development, community development, job placement, and other urban revitalization efforts under way in the City.

#### 4.6 KEY CONCEPTS

In researching Newark's waste supply and demand, the study team found that the most critical step in fitting recyclables to their markets is by effective yet inexpensive collection. The present City government is taking measures to enforce separation at the source and to make collection efficient for residential and commercial sources and for markets as well.

#### 4.7 CONCLUSION

This chapter has discussed the supply and demand dynamics of reclamation, focusing on recycling in particular, and presenting a supply and demand profile based on targeted materials, their sources within Newark's waste stream, and their existing and potential markets in the region.

The key to municipal waste utilization, efficient and inexpensive collection of uncontaminated (i.e., source-separated) waste, has up to now been lacking in Newark, but the establishment of such a disposal system is already underway. Moreover, the cost reduction for waste disposal that recycling presents makes it attractive.

# **CITY OF NEWARK OFFICE OF RECYCLING**

## **SOLID WASTE UTILIZATION STUDY**

### **CHAPTER 5: TECHNOLOGICAL OPTIONS AND ENTERPRISE OPPORTUNITIES**

#### **5.1 INTRODUCTION**

In its discussion of supply and demand, Chapter Four explained that fitting the supply of waste with market demand is the key to viable recycling efforts. This chapter presents options for **getting recyclables to their respective markets.**

To be consistent with the State of New Jersey's recycling goal of 25 percent of the municipal solid waste stream and Essex County's goal of 15 percent of the total waste stream (municipal plus commercial and some industrial solid waste), the City of Newark will need to recycle 116 tons per day (see Appendix 3). This is an ambitious goal that must allow for recycling's limitations in the marketplace: expense of collecting and processing materials, cost of transporting recycled goods, and low profit margin.

Where markets are strong, the value of the materials will generally inspire private sector interest in collection and processing. The free-market system, operating in Newark, can take credit for many thousands of tons of metals sold each year to scrap processors. It has stimulated the development of a private firm called Glass Cycle Systems, which specializes in glass recovery from bars. It has created interest among garbage haulers in removing, baling, and selling OCC.

Market forces have not been so successful in reducing waste when the costs of collection and processing have exceeded the value of the materials. It is in these instances that government can intervene to tip the balance. When governments consider their per-ton cost for collection and disposal, the option to reduce cost by facilitating recycling becomes very attractive. Realistically, recycling requires some form of partnership of the City's private enterprises, community-based organizations, and the City itself. Table 5-1 provides the 1984 value of recyclable materials bought and sold.

Based on review of technological options by the study team and City recycling staff, a variety of waste utilization options address the needs outlined in Chapter Four. These are presented below, followed by financing options. Although the order of the options is intended to present the most important cost reduction measures first, followed by those creating new or increased demand for materials, the listings are neither exhaustive nor indicative of absolute priority. Furthermore, the listings should not be construed as an endorsement by the City of Newark. As the success of any enterprise is dependent on a variety of factors, all options in this report must be thoroughly investigated prior to implementation.

Appendix 6 contains the contacts and their addresses for the options discussed in this chapter.



TABLE 5-1. VALUE OF RECYCLABLE MATERIALS BOUGHT AND SOLD, 1984

Material	Price	
	Market Value \$/lb	Street Value \$/lb
Newsprint	0.015	none
Aluminum	0.450	0.3000
Ferrous Cans	0.034	none
Glass	0.0225	0.01
OCC	0.025	0.0075
Oil	TBA+	?
Compost	0.007	none
Average Value *	0.048 #	--

\* Based on relative percentages of materials found in solid waste

+ TBA - to be arranged

# Does not include value of compost

## 5.2 WASTE UTILIZATION OPTIONS

### 5.2.1 Multi-Material Recovery

#### A. *Neighborhood Buyback Recycling Center*

A buyback recycling center is a depot at which money and/or scrip (equivalent paper currency, like "company money") is paid for recyclable materials, usually including aluminum, glass, and paper. Prices paid reflect present market value of the materials as prepared for processing by the buyback center operators. Buyback centers have emerged in urban areas in the last ten years as economic ventures. Only recently have they been seriously considered as a means to reduce the solid waste stream.

The Essex County study, *The Integration of Energy and Materials Recovery in the Essex County Solid Waste Management Plan*, suggests that buyback centers may be the primary means of achieving a high level of urban recycling.

Research by the City's recycling staff and the County Recycling Program manager indicates that a buyback center may serve the waste reduction needs of up to 40,000 urban residents of multifamily-dwelling units. The Resource Center at Chicago recycled 65 tons per week from an area with a population of 36,000, diverting 9 percent of the waste in the area. That center received 70 percent from door traffic, and picked up 30 percent in a curbside program.

In the Bronx, a buyback center called R2B2 was drawing 100 tons per week prior to enactment of the Returnable Beverage Container Deposit Law (the "bottle bill") in 1982. The tonnage processed now as a result of the "bottle bill" is greater, though the volume increase is primarily from the containers provided by distributors and not private citizens.

On January 21, 1983, a buyback center opened in Philadelphia. In its first year the center reclaimed 16 to 20 tons per month. Several privately owned buyback centers in New Jersey accept glass, aluminum, and newspaper among other materials.

Zozzaro Industries had been a paper high-grader; a buyback component was added to the company after an unsuccessful attempt at local curbside collection. Today their buyback operation is among their most lucrative activities, and principal John Zozzaro maintains that this kind of diversification can compensate for the uncertainties of shifting material markets.

A & P Paper Stock of Irvington, NJ, is a father-son business operated by the Bastardo Family for 35 years. The company's building and yard are located on an acre-and-a-half site; and with up to four workers, A & P processes 400 to 1,000 tons of combined newspaper, corrugated, glass, and aluminum monthly.

For urban areas, buyback centers create an intermediate market, providing access to the scavenger, energetic youngster, community organization or citizen. According to Mike Shedler of R2B2, some 50 percent of the materials come from 20 regular clients, although hundreds patronize the center each month.

According to projections by Newark's recycling staff, six to nine buyback centers are feasible for Newark, targeting a goal of 12,339 tons per year, or 6 percent of Newark's total waste stream.

## **B. CURBSIDE COLLECTION PROGRAM**

In an effort to divert some of the solid waste from entering the diminishing landfill space, the Newark Office of Recycling has selected five distinct areas for curbside collection of recyclable household waste, initially with the collection of newspapers, followed by the collection of co-mingled glass bottles, aluminum and bi-metal cans.

This program should focus on serving residential areas where there are housing units of one-, two-, three-, four-family homes, small apartment buildings and low-rise apartment complexes. A second consideration was the density of the housing units within a given area -- avoiding areas that have too many vacant lots and omitting large apartment buildings/high-rise complexes until further study is made.

After careful study the following five areas met the necessary criteria:

**SOUTH WARD**, area south of I-78 to the Hillside border and east of Weequahic Park to the City line;  
Estimated Population: 25,000

**VAILSBURG**, area west of the Garden State Parkway to the City line;  
Estimated Population: 36,000

**NORTH WARD - Western Sector**, area west of Branch Brook Park to the City line and north of Park Avenue to the City Line; this area also includes the northeastern part of the West Ward;  
Estimated Population: 19,000

**NORTH WARD - Eastern Sector**, area east of Branch Brook Park to Summer Avenue (include Lincoln Ave north of Arlington Ave) and north of Bloomfield Avenue to the City line;  
Estimated Population: 25,000

**EAST WARD** - Specific boundaries have not yet been designated since this area has a large number of commercial establishments and industrial areas. Keep in mind, high-concentration of residences is sought.  
Estimated Population: 45,000

Traffic volume is another factor to consider in scheduling the collection of recyclables. For example, combining pick-ups of recyclables at the same time as street-sweeping crews are out, could take advantage of empty streets.

The approximate total population affected within the ascribed areas is 150,000 residents -- roughly 48% of the entire Newark population. The program is flexible so that it may be expanded to serve even more residents, if curbside efforts prove successful.

The New Jersey State Office of Recycling estimates 100 pounds of newspaper, 100 pounds of glass bottles, and 5 pounds of aluminum beverage cans per person per year are discarded. The Steel Can Recycling Association estimates about 35 pounds of bi-metal cans per person are discarded.

By recycling newspaper, co-mingled glass bottles, aluminum cans and bi-metal cans, the City of Newark could generate income as well as avoid disposal cost as follows:

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Conversion Factor: 1 Ton = 3.3 Cubic Yards

---

**N E W S P A P E R**  
Based on 150,000 residents  
Generating: 100 lbs./yr/capita  
Total Pounds: 15,000,000/yr.  
Total Tons: 7,500/yr.  
Total C.Y.: 24,750/yr.

---

Participation Rate	25%	33%	50%	80%
	-----	-----	-----	-----
Total Tons Collected/yr.	1,875	2,475	3,750	6,000
Total C.Y. Collected/yr.	6,188	8,168	12,375	19,800
Market Return @ \$15/ton	\$28,125	\$37,125	\$56,250	\$90,000
Disposal Savings @\$5.825/cy	36,042	47,076	72,084	115,335
	-----	-----	-----	-----
* Newspaper Total	\$64,167	\$84,700	\$128,334	205,335
Revenue and Savings	-----	-----	-----	-----

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**CO-MINGLED GLASS BOTTLES,  
ALUMINUM CANS, AND BI-METAL CANS**

Based on 150,000 residents  
Generating: 140 lbs./yr./capita  
Total Pounds: 21,000,000/yr.  
Total Tons: 10,500/yr.  
Total C.Y.: 34,650/yr.

Participation Rate	25%	33%	50%	80%
	-----	-----	-----	-----
Total Tons Collected/year	2,650	3,465	5,2	8,400
Total C.Y. Collected/yr.	8,663	11,435	17,325	27,720
Market Return @ \$12/ton	\$31,500	\$41,580	\$63,000	\$100,800
Disposal Savings @\$5.825/cy	50,459	66,606	100,918	161,469
	-----	-----	-----	-----
* Total Co-Mingled Revenue and Savings	\$139,500	\$184,140	\$279,000	\$445,600
	-----	-----	-----	-----
*Grand Total	\$146,126	\$192,887	\$292,253	\$467,604

**REVENUE GENERATED**

Participation Rate	25%	33%	50%	80%
	-----	-----	-----	-----
Newspaper @ \$15/ton	\$28,125	\$37,125	\$56,250	\$90,000
Co-Mingle @ \$12/ton	31,500	41,580	63,000	100,800
	-----	-----	-----	-----
* Total Revenue	\$59,625	\$78,705	\$119,250	\$190,800

## A V O I D E D   D I S P O S A L   C O S T S

Participation Rate	25%	33%	50%	80%
	-----	-----	-----	-----
Newspaper Disposal Savings @ \$5.825/cy	\$36,042	\$47,076	\$72,084	\$115,335
Co-mingle Disposal Savings @ \$5.825/cy	50,459	66,606	100,918	161,469
	-----	-----	-----	-----
* Total Savings	\$86,501	\$114,812	\$173,002	\$276,804
<hr/>				
* Total Revenue	\$59,625	\$78,705	\$119,250	\$190,800
* Total Savings	\$86,501	\$114,812	\$173,002	\$276,804
<hr/>				
* Grand Total Revenue and Savings	\$146,126	\$192,887	\$292,253	\$467,604

\* Not included are the avoided cost of crew time or wear and tear of vehicles going to and from the landfill site.

In order for the program to run smoothly, each area should be brought on-line one at a time. Examining closely the traffic patterns, the ratio of commercial/industrial to the number of residents, and the location of the area to the available market, the following sequence of route implementation is suggested:

1. South Ward - South of I-78
2. North Ward - Western Sector
3. North Ward - Eastern Sector
4. Vailsburg
5. East Ward

The labor and equipment needed would be at least two crews of two persons on special recycling vehicles (see attached). Each vehicle is compartmentalized for separation of paper and co-mingled material to prevent contamination of collected paper.

### 5.2.2 Mixed Waste Processing Systems

#### *Glass and Plastics*

#### *Glass Markets*

In a recent report submitted to the New Jersey Recycling Forum by Clay Granoff of the Glass Packaging Institute, the glass industry offers "market proximity...as existing at seven locations from Millville to Wharton." The report states that cullet consumption capacity is "in excess of 200,000 tons." However, the report fails to address the extent to which this capacity is currently saturated; the prices, specifications, and colors purchased are also left unspecified.

Other sources indicate that to be marketable, glass will have to meet strict specifications for color separation, be relatively free of contamination, and be available in large and consistent quantities. With such restrictions, no single buyback center would likely secure a long-term market for its glass. On the other hand, the City generates enough glass to market cooperatively, and a cumulative volume of glass from all recycling operations in Newark would have substantial market leverage.

The packaging mix in the Northeast is also shifting to plastics, and so less glass will enter the waste stream. However, less glass will also be produced, so that the cullet markets will contract.

### *Plastics*

The polyethylene terephthalate (PET) container, is steadily gaining larger and larger shares of the packaging market, displacing glass and waxed paperboard.

Health regulations prohibit the refilling or recycling of used plastics containers for packaging foods or beverages. The supply of these used containers, therefore, will continue to grow and provide ample feedstocks for plastics recycling enterprises.

Plastics recycling is one of the most promising areas for entrepreneurial waste utilization investment. The technology and cost effectiveness of processing PET bottles into clean grind is very well established. Processors have quoted prices ranging from \$100 to \$220 per ton for baled PET bottles, with or without the HDPE heavy bottom, and with or without caps and rings. The demand for this product to replace the more expensive virgin resin may be virtually limitless. Manufacturers use the clean grind as fiber fill for clothing and upholstery, or molded into durable construction elements, such as fenceposts or dashboards for cars.

The challenge in taking advantage of these new markets is to develop cost-effective, primary collection and transporting systems. Buyback and drop-off centers will likely be the collection mode rather than curbside programs (unless plastics container legislation provides a returnable deposit to the consumer). Also necessary will be local facilities for intermediate processing to produce clean, segregated bales for cost-effective transport to a final processing facility.

All three of the firms listed in Appendix B for plastics expressed strong interest in expanding their production capabilities and working with local governments or investors to set up comprehensive recovery and recycling programs.

## 5.2.3 Paper Collecting and Processing Technologies

### *Cellulose Insulation*

Western Community Industries, Inc. (WCI), a company located in Fresno, California is a for-profit subsidiary of a nonprofit corporation. A \$350,000 grant from U.S. Community Services Administration (CSA) started Western Community Industries in 1978 to recycle newsprint into cellulose insulation for CSA home weatherization projects, private businesses, and retail sales outlets. Today, Western is a thriving business with an expanded line of products and services, providing jobs for more than 40 people, with wages more than \$500,000 per year. Purchasing newsprint from a local recycling program at \$55-65 per ton, WCI uses approximately 12,000 tons of newsprint per year to generate \$3.5 million in cellulose sales, enough to weatherize approximately 38,400 homes. The company earns another \$1.2 million from related conservation products and services such as caulking, weatherstripping, roofing, and energy-saving showerheads and electrical and plumbing supplies. They believe the "one stop shopping" (vertical integration) concept offers a competitive advantage over other cellulose suppliers.

Bill Eidson, President of WCI, reports that the single most important economic factor in operating a cellulose insulation manufacturing plant may be the seriousness of state and local policies regarding promotion of conservation. Government-sponsored weatherization projects can provide a "captive" market for much of the product. About 30 percent of Western's market is for CSA-sponsored low-income housing, and for projects sponsored by local utilities for elderly and low-income residents.

Western has invested more than \$300,000 additional funds to develop its own bulk chemical manufacture, and to acquire its own trucking system. Eidson explains, however, that it is likely that a profitable small-scale operation can be started with as little as \$100,000, especially if second-hand equipment can be purchased. During the oil crisis of 1979, a large number of companies sprang up to take advantage of the public's sudden concern with fuel conservation. Many of these firms folded when they subsequently failed to meet the minimum federal specifications for safety and effectiveness.

The market for good-quality cellulose insulation is still very strong. Although most new construction projects favor fiberglass insulation, more than 90 percent of the retrofit market for insulation favors cellulose because it is easy to install.

Eidson welcomes all inquiries from prospective project planners and investors: "We've learned a lot about all the right and wrong ways to do things, we would like to spare others some of the trial and error we've been through."

### *Animal Bedding from Waste Paper*

Dice-a-Bed, a company located in Tarrytown, New York, is affiliated with the American Independent Paper Mill Supply Corporation, a paper stock broker doing business with Garden State Paper and other mills around the country. Their product is basically shredded or diced newsprint, which has been tested as horse bedding, and is also in use by chicken and dairy farmers. Their Tarrytown operation is the only one they have, but they are actively beginning to look at the possibility of franchising the operation, and consider that Newark is a good location for another operation.

## 5.2.4 Composting Technologies

### *Leaf Mulch and Composting*

During the fall of 1985 the City diverted over 5,000 cubic yards of leaves from the landfill to the present compost site. This project is in an enclosed, patrolled area on property leased from a local public utility company. The finished product will be put through the shredding machine purchased with state funds. It is expected that the compost will be used by the City's Urban Gardeners, and that the compost program will become an ongoing part of the City's waste management policy.

### *Paunch Manure*

Bob Bauermeister is a Nebraska farmer who recently received a permit for applying co-composted municipal sludge and paunch manure on his own farm. The packer delivering paunch manure to Bauermeister passes the paunch manure through a wine press to reduce it to the consistency of wet hay. Capital investment funds are being sought to purchase equipment for expanding into a commercial-scale operation. Such a process could be utilized in New Jersey.

Many packing companies are in a crisis situation, searching for alternative means to process and dispose of their wastes because of new zoning restrictions prohibiting upgrading their treatment plants or siting new facilities. The practice has been to mix water with the paunch manure enabling it to flow through tanker trucks and onto fields.

### *Vermicomposting (composting enhanced by worm activity)*

One private experimenter, Mary Appelhof, reports that no successful, commercial-scale solid waste vermicomposting facilities are operating anywhere in the United States or elsewhere at present. The British government, however, in a \$5-million, four-year program at its Rothamsted Experimental Station, has involved 300 individual researchers and 16 organizations investigating vermicomposting. Their results were reported in July 1984 at the International Conference on Earthworms in Waste and Environmental Management, which was attended by 250 people from 25 countries.

The British government has licensed its full, detailed findings to an English firm, British Earthworm Technology (BET), which seeks to develop "processing depots" in cooperation with livestock growers and farmers. The system would produce a pasteurized, enriched potting soil for sale to gardeners.

Appelhof proposed that the USDA fund a project to inventory large-scale organic wastes within a 30-mile radius of Kalamazoo. The local bedding industries purchase 12-13 million tons of soil per year. Although Appelhof's proposal was rejected, she believes that this and related research should become a priority, because the United States is losing approximately 2 tons of topsoil each year.<sup>13</sup>

Camp Dresser and McKee, Inc., a firm reporting on six experimental projects in this country, concluded that vermicomposting would not be viable. Appelhof, however, points out that Camp Dresser's research was largely based on a telephone survey, rather than on site visits, and should be updated relative to current projects. Appelhof herself has gathered much anecdotal data regarding 65 home vermicomposting systems, virtually all successful. One 4-unit apartment building is processing all its food waste in a 4-ft-by-1.5-sq.ft. worm bin.<sup>14</sup>

She cautions vermicomposting enthusiasts against pyramiding promotion schemes that promise to sell starter kits and to buy back all the worms' offspring. Their market for the worms is simply that of selling to more "get rich quick" worm growers.

## 5.2.5 Automobile and Truck Tire Processing

### *Crumb Rubber*

The Nebraska Small Farms Action Group (NSFAG) funded by a grant from the Nebraska Department of Environmental Control has completed feasibility studies and is using crumb rubber as aggregate and as an additive to asphalt for paving and sealing cracks on state roads. The pilot operation, using buffings from retreaders, proved the economic feasibility and documented good performance characteristics of crumb rubber. The quantity of available buffings will not support a large-scale project; therefore, investment capital of \$800,000 is being sought to build a cryogenic processing plant to produce crumb rubber from discarded tires.<sup>15</sup>

Rubber asphalt increases the cost of road construction by 10 percent to 15 percent but doubles the road life because of the greater tensile strength it imparts. Steve Burdic of the group reports that a 2-percent mix of rubber in all the road asphalt projects in Nebraska would absorb all of the crumb rubber produced from tires discarded in the state; and he adds that this would hold true on a national level as well, ". . . old tires would become a scarce commodity."

Legislation proposed in Nebraska would revise state procurement specifications to ensure development of this market. Federal Department of Transportation guidelines for financing state roadways already will allow an additional five-percent revenue-sharing benefit to states incorporating recycled materials in their highway projects.

The New Jersey Office of Recycling reports that New Jersey generates approximately seven million waste tires, of which 90 percent are either buried in landfills or illegally dumped. This suggests that crumb rubber recycling is a very promising area for further investigation in Newark, which certainly has sufficient quantities of both old tires, and roads in need of repair and repaving. And, in fact, the Office of Environmental Services has been studying the problem since 1982. Some efforts to open a tire reprocessing facility in Newark have been abandoned because of fires, but the chance for recycling the great numbers of existing tires is still under investigation.

## 5.2.6 Demolition Recovery and Processing

### *Building Materials Salvage Yard*

As part of a landfill high-grading operation, Dan Knapp started a reclaimed building materials and appliance yard. The recovered materials include doors, windows, plumbing fixtures, shingles,



lumber, siding, and other small and large items and materials used in buildings. The yard serves the City of Berkeley's citizens and contractors involved in home repair, restorations, and modernizations. A considerable percentage of the yard's customers are those who could not afford to repair their houses at the new-item prices of the materials they can buy used from Urban Ore. In this way the project is not only a viable waste utilization enterprise, it also improves the character and economic viability of the City as a whole.

A building materials salvage yard in Newark would complement the inner-city revitalization efforts that are already in progress.

### *Recycled Concrete*

Rockrete, located on Frontage Ditch Road in Newark, is a mobile concrete recycling service for customers who wish to avoid disposal costs by crushing used concrete for stone or gravel substitute. The processing costs for their largest size "blend," with pieces 1.5 to 2.5 inches in diameter, is about \$6.00 per yard. They offer two finer grade blends, but these have not been in production long enough to have set costs.

Rockrete has also, in the past, accepted donations of concrete, and has done some marketing of this product. Most of their activity, however, is providing the mobile recycling service.

Rockrete is already a viable waste utilization enterprise. Potential exists for community groups to become involved in related activities.

### 5.2.7 Remanufacturing

Remanufacturing is an industrial process in which worn-out products are restored to a like new condition. Under remanufacturing, discarded products are completely disassembled. Useable parts are cleaned, refurbished, and put into inventory. Where necessary, new parts are made available. Then the new product is reassembled from old and new parts to produce a unit fully equivalent to the original product. Some remanufactured goods surpass original equipment in performance and expected lifetime. Remanufacturing has five stages:

1. Collection of the cores
2. Disassembly
3. Refurbishment
4. Reassembly
5. Distribution

Each stage represents value added to the already valuable core, or product element, which would otherwise enter the disposal system and be of no value at all. Remanufacturing is an attractive waste utilization enterprise because it requires minimal capital investment. The high level of technical information contained in the core is retained: expensive heavy equipment to duplicate it is therefore unnecessary. Similarly, difficult and technically sophisticated labor has gone into the manufacture of the original item: it is not needed for remanufacture, which typically offers a number of low-skilled, entry-level jobs.

Although the waste reduction impact of any particular remanufacturing venture is quite small, the cumulative effect of developing a remanufacturing sector in Newark is attractive. In addition to waste reduction, remanufacturing contributes to urban self-reliance by creating jobs and by making the remanufactured items available to the urban community at a lower cost.

In Newark, NIMCO Company, an affiliate of Naporano Scrap Metals has been remanufacturing buses for a number of years. Recently, the company became discouraged with remanufacture of whole buses, and has restricted activities to rebuilding bus parts. A Naporano representative acknowledged the profitability of the process, but explained that the slow turnover in bus customer procurement procedure placed NIMCO at an unacceptable risk.

Commercial products being remanufactured in the United States include:

- o **Automotive:** Automotive parts for automobiles and trucks constitute the largest application of remanufacturing in the United States today. These parts range from simple starter solenoids to complete diesel engines.
- o **Industrial equipment:** Industry process valves, hydraulic equipment, heavy-duty diesel engines, production metal working machines and oil-drilling equipment.
- o **Commercial products:** Office machinery, compressors for commercial refrigerators, vending machines and communications equipment.
- o **Residential products:** Power tools, lawn mowers, appliances, garbage disposal units, and other durable goods are among the many items currently being remanufactured.

In his comments at an Essex County Community College Conference in 1984, Dr. Robert Lund, author of the hierarchy of reclamation (described in Chapter One), indicated that while it has had low visibility, remanufacturing has been economically viable in many parts of the world for decades. Pointing out that many of the factors conducive to developing and maintaining remanufacturing ventures are present in the New York/New Jersey metropolitan region, he remarked that remanufacturing concerns are not likely to relocate overseas: the labor pool that they draw from is relatively low-skilled and therefore affordable here, and there is a greater availability of high-quality cores in the industrialized United States than would be in one of the less-developed countries.

Dr. Lund recommended surveying the industrial stock in the Newark/Essex County area to identify specific opportunities. Participants at the conference felt that the Port Authority of New York/New Jersey would be the best candidate to sponsor such a study.

Additional information on remanufacturing and the continuing research can be obtained by writing to the MIT Center for Policy Alternatives in Cambridge, Massachusetts.

## 5.2.8 Energy-Related Technologies

### *Processed Wood for Fuel*

In 1983, Proctor and Gamble (P&G) installed a wood-fired boiler to generate process steam, steam heat, and electricity for their Ivory Soap Plant, about 14 miles from Newark. Proctor and Gamble purchases whole or chipped "processed" waste wood for use in their furnace. Their needs vary seasonally, not only because of greater heating needs in the winter, but also because during the summer the boiler only operates five days per week, and during the winter it operates seven days.

At about \$17.00 per ton for unprocessed wood, most of their wood was purchased under contract to industries that generate wood in their manufacturing, to pallet shops, to scavengers, to entrepreneurs, and to demolition contractors willing to extract the wood. Currently, Proctor and Gamble is accepting wood, but it does not pay for the delivery. Customers now only receive the benefit of avoided disposal cost.

Proctor and Gamble's priority is to identify additional sources of chipped or processed wood. The plants throughput capacity for wood utilization is limited by the throughput of its "hawgger," a large conveyor-fed chipper; the company would pay a premium for already chipped wood. Representing the Proctor and Gamble plant, Mr. Amoia indicated a willingness to discuss a number of options with parties interested in developing wood extraction businesses. He did not rule out advances on a contract, or some type of loan to finance processing capacity. Collection and processing of wood could be a small-scale waste utilization enterprise suitable to a community group in Newark.

## *Steam and Electricity Cogeneration*

A 270-ton per day waste-to-energy system has been designed for a private company in Philadelphia, PA. Formerly known as the Hulton Dye Works, this company reorganized as the Hulton Power Company when the market for its services became unprofitable. Hulton will sell electricity at \$.045 per kilowatt, and also will provide some heat to other tenants of the plant's building. Each ton of municipal solid waste is expected to generate 440 kilowatts of energy. While Pennsylvania air pollution standards are not as stringent as New Jersey's, resource recovery systems such as this would reportedly meet New Jersey standards as well.

All wastes are to be delivered to the Philadelphia plant by private contract with independent refuse haulers. Tipping fees will start at \$28 per ton. This price will escalate but will remain competitive with surrounding landfill disposal options. No waste flow directives have been sought from municipal or state authorities.

Commercial Credit Company, having prepared the financing package for the plant, will get 50 percent of all the energy revenues. They anticipate that Hulton Power will receive a full payback on their investment in less than five years. Another of the financing provisions will allow Hulton to receive federal energy tax credits.

Because this is entirely a private sector project, the planning-to-implementation schedule will be no more than 12 months. Gene White, who provided the Consumat equipment for the project, advises that the same project, if pursued by a municipal government, would probably have taken three years or longer.

### **5.3 ENTERPRISE SUPPORT AND FINANCING OPPORTUNITIES**

The development of enterprises that effectively reduce waste and promote economic development will require involvement by the City of Newark, the County of Essex, the Port Authority, private entrepreneurs, and community-based organizations. Each of these sectors has a potential role in financing and supporting the development of a waste utilization infrastructure.

The largest cost will be in initial investment and capitalization of the collection and processing infrastructure and the accompanying technical assistance, including managerial, technical and other training. To maintain high levels of public participation and a continuous flow of information to the members of the reclamation sector, Citywide coordination of promotional and public education will be an ongoing need.

Viewed as an economic development tool, recycling presents extraordinary opportunities in urban areas such as Newark. Some cities have realized this, and have already mobilized traditional economic development tools to finance waste utilization enterprises. In Howard County, MD, for example, a \$5-million industrial development revenue bond financed a crumb rubber plant. A composting facility in the South Bronx, in New York City, was funded with assistance from an Environmental Quality Bond. Buyback centers in the Bronx, New York, and Philadelphia were financed through a combination of foundation and government grants for economic development.

A less conventional approach finances recycling and waste utilization activities out of funds collected or created in conjunction with waste disposal activities. City and county surcharges in Champaign, Illinois, and Boulder, Colorado, provide \$100,000 annually to local recycling agencies. In Boulder, the local nonprofit that operates a recycling program, Ecocycle, negotiated with EPA officials to allow local environmental fines to be used locally instead of being awarded to the federal treasury.

In other cases, funding for recycling has come from city or county solid waste management budget. Projected funds saved through waste diversion made it possible in Grand Rapids, Michigan and Minneapolis, Minnesota to offer funds as a payment per ton of material recycled, and to justify free or low rent facilities for recycling businesses in St. Paul, Minnesota, and Berkeley, California.

In Newark, these options are supplemented by funding opportunities created by the New Jersey Recycling Act. The New Jersey Office of Recycling (NJOR) was created in 1980. Support from a statewide surcharge on solid waste disposal allows the state Office of Recycling to offer funding for recycling activities through three programs. The Program Planning and Education Grant is available to municipalities and nonprofit organizations through an annual competitive application process. The City of Newark applied for funding through this program in 1982 and 1984, receiving support in the first application for a full-time Recycling Coordinator. The 1984 application, targeted support for a City composting project and Buyback Center Education/Promotion project.

The New Jersey Office of Recycling also offers the Municipal Tonnage Grant Program. Tonnage grants are awarded on a noncompetitive basis by documented tons of material recycled. The City has applied and received recycling tonnage grants in excess of \$140,000 for 1982 and 1983, and over \$112,000 for 1984 alone (see Appendix 3). These funds will support a recycling program as outlined in the Plan of Action, which follows the Waste Utilization Study. The NJOR also offers a low-interest loan program for private businesses.

Additional sources of funding include:

- o **The Natural Resources Bond Act:** Since 1972, the act allocates \$190,000 on a 2-to-1 matching basis for low-technology recycling. Negotiations are currently underway to determine how this funding can be used to capitalize private, for-profit, non-profit, and City efforts to initiate recycling programs.
- o **Recycling industry equipment loan programs:** In the past, ALCOA, Anheuser-Busch, Reynolds Metals, Owens-Illinois, and Garden State Paper have provided equipment, transportation, and technical assistance to recycling activities. Most recently, ALCOA assisted the Orchard Street Association in upgrading a buyback operation, and gave a \$5,000 advance to allow for material purchases.
- o **Low rent on City-owned equipment:** Newark Recycling, Inc. set a precedent for the City of Newark, which provided City-owned equipment at a minimal charge. Under a recently passed state law, the City can also choose to sell property to a nonprofit organization without the bidding process typically required.
- o **The Essex County Board of Chosen Freeholders/Port Authority:** With a recycling goal of 15 percent of waste in the county, Essex County planners were able to downsize the Energy Recovery Facility by 15 percent, with a substantial savings in capital investment and a projected reduction in the volume of residue. The County of Essex and the Port Authority may provide support to participating municipalities in the development of other recycling programs that promise similar waste and cost reduction.
- o **Municipal subsidy:** Currently, combined solid waste collection and disposal costs approximately \$50 per ton (1982 est.) in Newark. Because each ton diverted will benefit the City, it may be advantageous to offer a diversion subsidy to recognized buyback centers. Such a subsidy could take the form of price supports for materials to stabilize the market place for recycled materials. The City may also provide start-up equipment for buyback centers, and will embark on a public relations and education campaign to support each center. The City should also fund its own waste reduction and recycling projects, including the leaf-composting operation and recycling of City Hall office ledger paper.
- o **The Campaign for Human Development:** The Catholic Church has established a program with \$8 million per year in start-up funds for promising local projects.
- o **World Fund Domestic Vision:** While similar to the Campaign fund above, the World Fund provides support exclusively for inner city minority church groups starting economic development enterprises.

- o **Local Initiative Support Corporation:** Funded by the Ford Foundation, this fund provides matching dollars to initiate economic development projects.
- o **Program Related Investment Programs:** Introduced by banking insurance companies' corporate donor programs, Program Related Investment is essentially a loan or grant to start a business in an area where there is a history of program development. For example, ABC Insurance Company will invest in a recycling business if it is run by, and benefits, community groups already receiving funding for other projects such as housing, nutrition, anti-crime, and so on. Programs of this kind have been offered by Prudential, Equitable, and Aetna.
- o **Loans from existing firms:** This method was used by Urban Ore of Berkeley, California, with a \$5,000 loan from the construction company which ran the landfill.
- o **Community development block grants:** These are a traditional source of funds for community economic development.
- o **Welfare and juvenile division programs:** The Federal Department of Health and Human Services (HHS) has provided \$250,000 to Recycling Unlimited in Ann Arbor, Michigan for a recycling program hiring welfare recipients. Federal juvenile justice agencies are also possible sources of funding for enterprises diverting crime. Newark Recycling, Inc. received significant funding support using a similar approach in rehabilitating ex-offenders.
- o **Sheltered workshops:** The Occupational Center of Essex County (OCEC), an organization serving the employment needs of mentally disabled adults, will be a major participant in a curbside program now being implemented by the County of Essex. Mt. Carmel Guild, a day-center for mentally disabled adults in the City, has also expressed an interest in "becoming involved" in recycling. Sheltered workshops usually do not provide financial support: what they can provide is subsidized labor for recycling programs.

## 5.4 KEY CONCEPTS

Resources exist, both within Newark and throughout the country, out of which to build a comprehensive recycling program in the City of Newark. Many private funding sources may be tapped as well as municipal, state, and federal grant programs to capitalize collection and processing ventures. The most efficient and effective infrastructure to accomplish the economic and ecological goals cited in this study will be a partnership among the City, private enterprise, and community-based organizations. Surrounding these efforts, the City needs to build the goals of recycling into its primary goals in order to educate the public and facilitate open communication among the reclamation sector and the public continuously.

## 5.5 CONCLUSION

This chapter presented options and funding sources for collecting and processing solid wastes in Newark. Some markets already exist and need little incentive to continue. Others will require grants, subsidies, and other creative development tactics to survive. Chapter Six makes specific recommendations to the City of Newark to begin developing a comprehensive recycling program based on the information gathered in this chapter and in the previous chapters.

# **CITY OF NEWARK OFFICE OF RECYCLING**

## **SOLID WASTE UTILIZATION STUDY**

### **CHAPTER 6: SUMMARY AND RECOMMENDATIONS**

#### **6.1 SUMMARY**

Chapters One through Three outlined the theoretical basis for Newark's waste disposal system to include recycling, the history of reclamation activities, and the history of the public officials and ordinances regulating those activities. Chapter Four, after detailing the amount of waste available for recycling and the existing markets for those recyclable materials, suggested areas and industries into which recyclables should expand in Newark. Chapter Five presented the waste utilization options addressing the needs outlined in Chapter Four, prefacing itself by reiterating an overall message of this Study: a partnership from among the City's private enterprises, community organizations, and the City itself will be critical to the success of waste utilization development in Newark.

For waste utilization, in particular recycling, Newark is in the best and worst of times. The City has a history of promoting recycling and solid waste management; a sizable salvage industry exists; local and export markets are available for reclaimed materials; funding is available from a variety of sources.

The successes and failures of past recycling ventures have been valuable; these experiences and current market conditions point to the need for integrated planning and comprehensive approaches to broaden and sustain such activity. In light of declining glass markets, increasing amounts of plastics in the waste load, and other shifting circumstances, the City government must integrate its plans for resource recovery with those of private enterprise. Recycling and solid waste management must be considered integral functions of all City decisions to actually reduce waste and develop the economic opportunities of reclamation.

#### **6.2 RECOMMENDATIONS**

##### **6.2.1 The Role of the City of Newark**

The City should, as policy, support waste reduction and economic development through recycling and waste utilization enterprises, in the form of public/private partnership and through private enterprise.

##### **6.2.2 Blue Ribbon Recycling Committee**

The City should form an ad hoc Blue Ribbon Recycling Committee to:

1. Assist in implementing the findings of this study.
2. Consider the recommendations for institutional change.
3. Help formulate Newark's immediate, intermediate, and long-term recycling goals.

This committee should act as a planning group for other waste utilization enterprises and as an advisory board to the City's Recycling Program Coordinators.

##### ***Recycling Staff***

Currently, recycling activities are being pursued primarily by three members of City staff. The Recycling Coordinator and two Environmental Specialists assigned to recycling both reside in the Department of Engineering's Office of Environmental Services. These staff are supplemented with a secretary.

Retaining the institutional relationships, it is recommended that a Waste Utilization Center be established under the direction of the Recycling Coordinator. The Center will serve as a base for these city staff members to develop the elements of the City's recycling policy in cooperation with other City and non-City agencies and institutions pursuing complementary objectives. The center would also house a library and archive of recycling and other waste utilization documents, educational and promotional materials for loan, and a meeting site for community and entrepreneurial representatives pursuing activities connected to waste utilization.

### 6.2.3 Development Priorities

The following City agencies should coordinate existing functions to promote and enhance recycling development:

- o Department of Engineering
- o Mayor's Office
- o Newark Economic Development Corporation
- o Newark Board of Education
- o Love Newark...Keep it Clean

### 6.2.4 Ordinances

The City of Newark Municipal Council should enact changes in Title 13A and Title 8, Chapter 8, of the Revised Ordinances of the City of Newark.

Title 13A requires a license and fee from anyone collecting and/or hauling recyclables and solid waste, prohibits unauthorized persons from disturbing (i.e., scavenging) curbside wastes, and limits the period of time waste may be set out for collection without regard to recyclables separate from other wastes and limits the areas collectors may enter to pick up wastes.

#### **Recommended Actions:**

1. Exempt vehicles carrying under one ton of recyclables only.
2. Repeal prohibition against unlicensed collectors of recyclables.
3. Allow recyclables to be set out separately from nonrecyclables.

Title 8, Chapter 8 defines junk and regulates who may deal (gather and sell) such commodities. Fees required do not address the differences in size among businesses. Required licensing fees and bond fees of \$500 each are likely prohibitive to many potential "junk dealers."

#### **Recommended Actions:**

1. Repeal requirement for dealer to be U.S. citizen.
2. Revise the fee system to account for the size of the establishment, and allow the fee to be set aside in a special fund for promotion of City recycling efforts.
3. Revise the bond requirement into a tiered system similar to the license fee recommendation or repeal requirement for recyclers.
4. Repeal \$75 license fee for collection by vehicle or foot since the fee effectively prohibits youth and other likely scavengers.

### **Other recommendations for Municipal Council actions include:**

- o Mandate separation of garbage into recyclables (glass, cans, newspapers and corrugated), compostables, and everything else, with a separate day for recyclables and compostables to be put on the curb.
- o Initiate a procedure whereby organizations may become buyback centers and qualify for city support.

#### **6.2.5 Legislative Response**

The Recycling Coordinator, working jointly with the Mayor's staff, should maintain a legislative vigilance for City, county, state, and regional ordinances, laws, and regulations that will likely impact the City's waste utilization development efforts. The City should support statewide adoption of beverage container deposit legislation (see Appendix 8).

The City staff should also monitor occurrences in the agencies responsible for community economic development, urban redevelopment, commercialization, or industrialization that might create capital for waste utilization enterprises in Newark.

#### **6.2.6 Program Development**

##### ***Recycling Goals and Limitations***

The City should establish an initial recycling goal of 696 tons per week (see Appendix 3) by July 1987 (see Table 6-1). This is consistent with the State of New Jersey's goal of 25 percent of the municipal waste stream and Essex County's goal of 15 percent of the total waste stream (municipal plus commercial and industrial solid waste). Given six collection days per week, an average of 116 tons should be recycled per day (see Appendix 3).

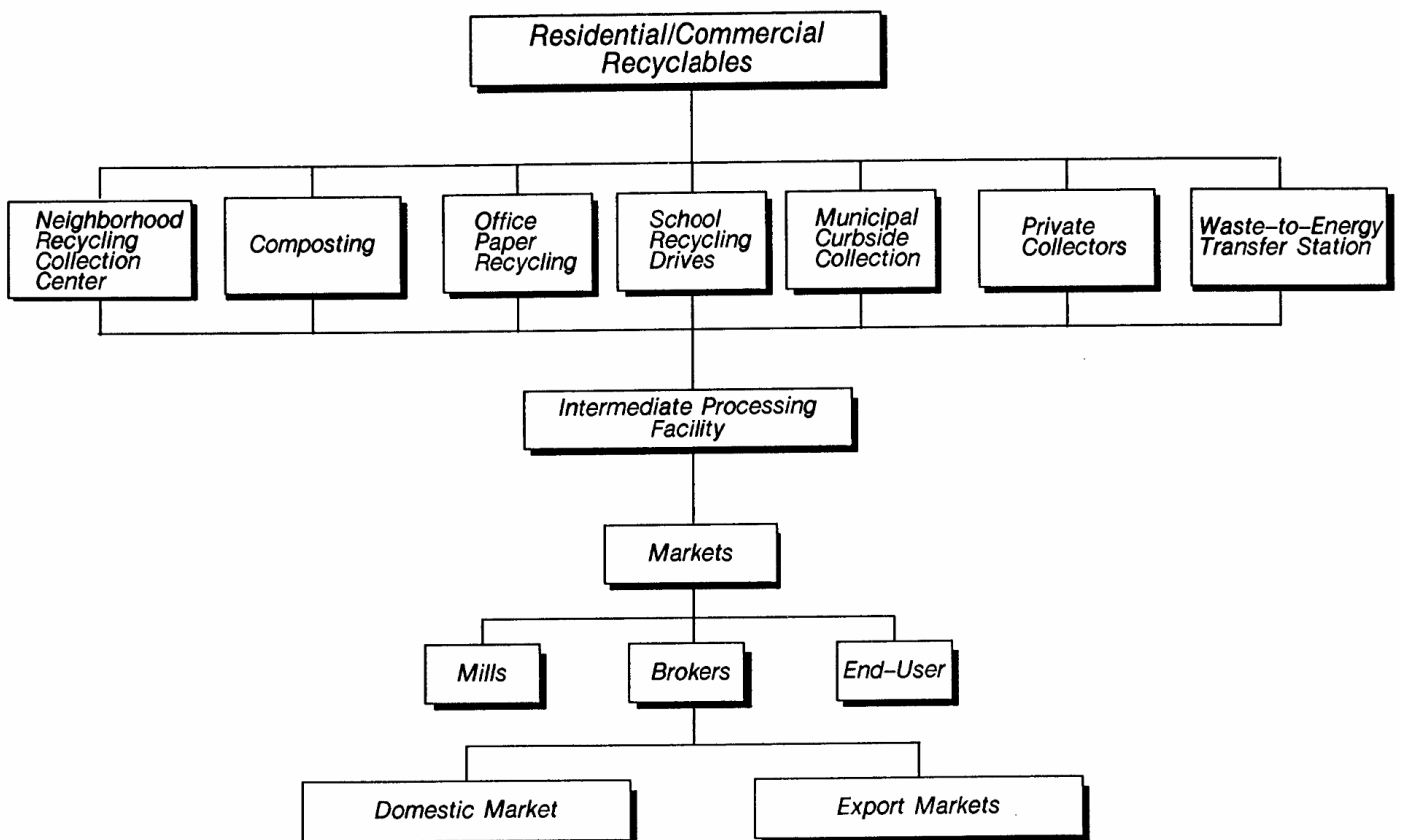
According to data presented in Chapter 4.2, priority materials for recycling should be organic waste (for compost), old or corrugated containers, newspaper, glass, aluminum, and ferrous metals. Comprising 62 percent of the waste stream, these materials represent the greatest potential for waste diversion through recycling and composting.

This ambitious goal must allow for recycling's limitations: the expenses involved in collecting and processing recyclables, the expense of transporting recyclables to their markets after processing, the low profit margin inherent in recycling.

The recyclability of the waste stream is also an issue. If fully implemented, the strategies offered in this document can provide for 100-percent recovery of the waste stream only if the waste stream is 100 percent recyclable. It is not. The trend in packaging is toward increased use of plastics and other complex and composite materials. In other cases, as with the new "brick-paks" used for juices, the package contains so many diverse materials that the components cannot be separated. As these non-recyclable items enter the waste stream, the recyclable percentage shrinks. Fundamental shifts in public policy would have to occur to offset these marketing and manufacturing trends. Left to itself, the free-market system as it currently operates will produce a waste stream predominantly composed of plastic by the end of the century. Given current trends in plastic packaging, the only viable disposal technology for much of the plastic-dominated waste stream is incineration.



TABLE 6-1  
CITY OF NEWARK  
RECYCLING SYSTEM



## *Program Development Criteria*

A number of enterprises have been suggested for development. These are broad suggestions, and should not be implemented without serious scrutiny. Some suggested criteria for enterprise development are that any enterprise should:

1. Reduce the municipal waste stream.
2. Create opportunities for income and jobs for Newark's unemployed, unskilled, and semiskilled residents.
3. Operate independently or with minimal support of municipal or other outside financing. Priority should be given to support enterprises which demonstrate their:
  - a) benefits to community groups and neighborhood organizations
  - b) provide the opportunity to expand existing industry
  - c) attract new industry to Newark
4. Reduce litter.

## *Priority Enterprises*

1. **Composting** of leaves, household and restaurant compostables. The City's leaf fall represents as much as 7 percent of the waste stream. Backyard composting should be encouraged based on the Canadian experience; a program of special collections of food waste from restaurants should also be examined for implementation (Goal: 18,000 tons or 8 percent of the total waste stream.) **Wood recycling** should be examined for contracting arrangements with Proctor and Gamble. (Goal: 4,740 tons or 2 percent of the waste stream.)

2. **Buyback center network** and curbside collection should target aluminum, glass, newspaper and corrugated. (Goal: 12,339 tons or 6 percent of the waste stream.) and should be organized into a cooperative to examine mutual needs and opportunities to increase volume. The City should examine the possibilities of support through start-up assistance, management systems and training, and market contract negotiations. Since buyback centers elevate the role of the scavenger, the City should examine methods to enhance the scavenger's productivity, such as special carts, mandating curbside separation of refuse, and special awards.

3. **Office paper recovery** program for City Hall, promotion and technical assistance to janitorial services and the management of other facilities in Newark. (Goal: 27,000 tons per year or 1 percent of the waste stream.)

4. **Dry commercial waste recovery** for which this Study recommends establishing two to four facilities. While these facilities should be privately operated, the City should provide assistance on locating financing and sites. (Goal: 26,500 tons or 10 percent of the total waste stream.)

5. **Tire recycling** technology is well developed, but has no market and is marginally profitable, if at all. The City should encourage the state legislature to require the Department of Transportation to utilize the maximum percentage of crumb rubber possible in road repair. (Goal: eliminate the tire blight from Newark; percentage of waste stream undetermined.)

### 6.2.7 Enforcement

The City should enforce procurement policies already in place for recycled paper and work to implement other policies for procuring recycled commodities, where appropriate, and for recycling commodities currently used (i.e., motor oil from City fleet vehicles).

### 6.3 CONCLUSION

This culminates the Newark Waste Utilization Study. A Plan of Action, citing short- and long-range goals and specific tasks to implement the recommendations of this Study and serve as policy for the City has also been completed. Until preparation of these documents, urban recycling had not been investigated for the dual purposes of waste reduction and economic development. It is recommended that all efforts be carefully documented and a revised Plan of Action be prepared annually. This will provide both a model and a case study for other urban efforts, and will spotlight Newark as the leader in urban waste utilization in the United States.

## APPENDIX 1

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## APPENDIX 2

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**APPENDIX 3**  
**RECYCLING BACKGROUND DATA FOR THE CITY OF NEWARK**

## APPENDIX 3: Recycling Background Data from the City of Newark

### A3-1 GENERAL BACKGROUND

#### 1. DEVELOPMENT CRITERIA

The criteria for developing a comprehensive recycling program in Newark must address the following issues:

- a) Reduction of the combined Municipal Commercial and Industrial Solid Waste stream in conjunction with the State and County goals.
- b) Impact on the litter problem.
- c) Provide opportunity for community economic development supplemental income for Newark residents.

#### 2. NEWARK'S SOLID WASTE

##### Volume and Composition\*

- a) Combined Solid Waste Total for 1982 Municipal Solid Waste 161,264 tons/year or 517 tons per day **Commercial/Industrial Solid Waste** = 65,168 tons/year\*\* or 209 tons per day\*\*

Total combined SW for Newark 225,432 tons/year = 726 tons per day\*\*

- b) Combined Composition by Weight (tons)

Newspapers	13,243.52	5%
Corrugate	36,262.24	16%
Glass	15,259.32	7%
Aluminum	2,341.64	1%
Ferrous	12,376.44	5%
Plastic	15,043.92	7%
Organics	72,016.48	32%
Wood	18,959.48	8%
Fines	12,934.25	6%
Misc.	27,994.36	12%

\* According to extrapolated figures from 1980 and 1982 City of Newark Sanitation Reports and the Port Authority's 1980 Composition and Weight Study of Municipal Solid Waste.

\*\* Based upon a 312 day per year collection schedule

- c) Newspaper, Corrugate, Glass, Aluminum, Ferrous Recyclables are equivalent to 35% (65,483.16 tons annually) of solid waste.
- d) Wood products can be reused or burned. Future composition studies should further investigate the wood component of solid waste; organics can be composted but will not be examined in depth at this time.
- e) Currently, there is not a viable market for plastics. There are a variety of issues in this regard which are being studied for future presentation.
- f) 82% of Newark's waste stream has the potential for diversion through recycling or composting.



### 3. STATE, COUNTY AND CITY RECYCLING GOALS.

- a) The New Jersey Office of Recycling supported by data out-lined in their report "Recycling in the 80's," set a recycling goal of 25% of the municipal solid waste stream by 1985.
- b) Supported by their study "The Intergration of Engery and Material Recovery in the Essex County Solid Waste Management Program," Essex County has set an overall recycling goal of 15% for the County with 10% reduction of the total urban waste stream and 20 to 25% of the total surburban waste stream.
- c) The City of Newark recycled 5% of the total potential solid waste in 1982.
- d) The Recycling Goal for the City of Newark is 116 tons per day which represents 15% of the potential solid waste in Newark. This is equivalent to the County Goal as well as the State goal which is 25% of the Municipal Solid Waste Stream.

### 4. REACHING NEWARK'S RECYCLING GOAL

Elements of a comprehensive program are comprised of at least the following:

- a) Redemption Center with as many as nine satellite operations to purchase glass,news-paper, aluminum, and bimetal cans from the public. These sites should be community oriented and geographically sited to serve 36,000 people each. (GOAL: 12,339 tons per year or 6% of waste stream).
- b) Curbside pick up of corrugate cardboard from among the commercial routes in Newark. (GOAL: 10,879 tons per year or 4% of the waste stream).
- c) Setup office paper recycling program in-house, provide technical assistance in the establishment of office paper recovery programs and waste analysis to determine possible recycling options, for office buildings in Newark (Goal 2700 tons per year or 1% of waste stream).
- d) White goods collection to avail recycling of old refrigerators, hot water tanks, etc., (GOAL: 552 tons less than .002% of the waste stream).
- e) Some form of composting based on a study of Newark's organic wastes.
- f) A program of reuse, in particular with regard to the wood in the waste stream.
- g) Promotion, purchase and use of recycled and recyclable materials.
- h) Continuous education, and public relation programs for recycling and litter (immediately for schools and publicly relative to existing program).

### 5. IN HOUSE RECYCLING

In-house recycling will be considered material collected and sold by the City. These will include:

- a) Corrugate  
(from Curbside Program) @ \$35.00 per ton
- Office Paper  
(50% of available paper from City buildings) @ \$35.00 per ton
- Collection of White Goods @ \$14.00 per ton

- b) Municipal Revenues
- |                                      |              |
|--------------------------------------|--------------|
| Corrugate 10,879 tons/yr. x \$35. =  | \$380,765.00 |
| Office paper 119 tons/yr. x \$35. =  | 4,105.00     |
| White Goods 667.7/tons yr. x \$14. = | 9,348.00     |
|                                      | <hr/>        |
| Municipal Revenues                   | \$394,278.00 |
- c) Total tons Recycled in Newark: projected for program at optimum.

	Tons	With a Recovery Rate of	Waste Stream Percent
o Redemption Center	12,339	40%	5%
o Office Paper Recovery	2,700 Non-City	50%	1%
o White Goods	533	100%	.033%
o Corrugate Collection	10,879	50%	4%
o 1982 Tonnage Recycled	13,481		

- d) Calculation --- City of Newark

Landfill Avoidance Costs	\$744,676.05
Rebates from Private Haulers	29,005.00
NJ Office of Recycling	109,755.00
Revenues In-house Recycling	\$394,278.00

TOTAL BENEFITS TO THE CITY OF NEWARK \$1,277,734.05

This figure represents a one time award based on \$5.00 per ton for 21,955 tons.

- e) Observations  
A multifaceted approach through redemption centers, office paper recovery and corrugate programs will be essential in reaching the 15% waste stream diversion goal.

## 6. BENEFITS TO NEWARK

- a) Assumptions:

- 1) The City of Newark's benefit consists of landfill cost avoidances, rebates from the City's private hauler, (in the one-third portion of the City collected by contract), and grants from the State of New Jersey as well as revenues from all sources of in-house recycling.
- 2) Landfill avoidance costs will consist of:  
Tipping fees \$8.56/ton x 13,010 tons = \$111,365.00  
2,243 trips to landfill x 282.35 = \$633,311.05  
Landfill Avoidance Cost = \$744,676.05.
- 3) 1/3 of municipal tonnage figures will be attributed to collections in private area (4927 tons \$6.75 per ton = \$29,005.00.
- 4) Legislation provides for rebates only for tons in excess of those reported in the prior year. For purpose of estimating future revenues, the State of New Jersey rebates will be assumed to be \$5.00 per ton for each ton beginning in 1983. (As of 2/23/83 this would be all tons in excess of 18,115 tons).

## A3-2 DETERMINING NEWARK'S SOLID WASTE TONNAGE

1. Municipal Solid Waste for 1982 (MSW 1982) 645,000 cubic yards as taken from the 1982 Annual Report, City of Newark Division of Sanitation (includes refuse, bulk, street sweepings, leaves, brush, branches, and lot clean up debris).
  - a) 4 cubic yards of MSW = 1 ton
  - b) 1982 MSW in cy : 4 cy/ton = 1982 MSW in tons
  - c)  $645,055 : 4 = 161,263.75 \text{ tons} = 161,264 \text{ tons MSW 1982}$
2. Commercial/Industrial Solid Waste for 1980 (C/I SW-1980) is equal to 193.4 tons per day according to Port Authority's study of Municipal Solid Waste, December 1980.
  - a) Assumes 312 collection days/year (equal to City pickup)
  - b)  $312 \text{ days} \times 193.4 \text{ tons/day} = 60,340.80 \text{ tons in 1980.}$
3. Reconciliation Port Authority figures of 1980, with City of Newark figures of 1980.
  - a) From City of Newark-Division of Sanitation Report
 

1980 City reported 599,853 c.y.  
1982 City reported 645,055 c.y.
  - b)
 

1980	599,853
1982 = % of change;	654,055 = 92% or 8% increase
  - c)  $8\% \times 60,340.80 \text{ tons (C/I SW 1980)} = 65,165 \text{ C/I SW-1982}$
4. Combined Total Solid Waste for Newark 1982 (CTSW -1982)
  - a)  $(\text{MSW-1982} + (\text{C/I SW-1982})) = (\text{CTSW 1982})$
  - b)  $161,264 + 65,168 = 226,432 \text{ tons/year CTSW - 1982}$
  - c)  $517 \text{ MSW} + 209 \text{ CTSW} + 726 \text{ tons/day CTSW-1983}$
  - d) Observation: Commercial Industrial Solid Waste equal to 40% of the Municipal Solid Waste  
(\*All figures determined by dividing SW annual figures by 312 collection days.)
5. Composition Breakdown; composition percentages from 1980 Port Authority Study of Municipal Wastes, tonnage figures based on computations above.

CHART A3-2a

ITEMS	(%)	RESIDENTIAL TONS	(%)	COMMERCIAL TONS	TOTAL TONS	(%)
Newspaper	(7)	11,288.48	(3)	1,955.04	13,243.52	(5)
Wood	(1.25)	2,015.80	(26)	16,943.68	18,959.48	(8)
Plastic	(6.50)	10,482.16	(7)	4,561.76	15,043.92	(7)
Glass	(8.25)	13,304.28	(3)	1,955.04	15,259.32	(7)
Ferrous	(5.25)	8,466.36	(6)	3,910.08	12,376.44	(5)
Aluminum	(1.25)	2,015.80	(.5)	325.84	2,341.64	(1)
Corrugate	(14.00)	22,576.96	(21)	13,685.28	36,262.24	(16)
Organics	(39.00)	62,892.96	(14)	9,123.52	72,016.48	(32)
Fines	(6.00)	9,675.84	(5)	3,258.40	12,934.24	(6)
Misc.	(11.50)	18,545.36	(14.5)	9,449.36	27,994.72	(12)
TOTAL	100%	161,264.00	100%	65,168.00	226,432.00	100%

**A3-3 NEWARK RECYCLING FIGURES  
FROM THE 1982 TONNAGE GRANT APPLICATION**

**MUNICIPAL CREDIT**

PAPER		1,321.32 Tons
High Grade	.05	
Newspaper	1321.27	
Glass		54.78
Ferrous		115.60
Aluminum		76.44
Motor Oil		.13
Total		<u>1,568.27 TONS</u>

**COMMERCIAL/INDUSTRIAL CREDIT**

Paper		8,208.47
High Grade	5,378.40	
Corrugate	1,368.84	
Other Low Grade	1,461.23	
Glass		7.726
Motor Oil		136.26
Other		3560.44
		<u>11,912.44</u>
COMBINED TOTAL		13,481.50 TONS

**A3-4 CALCULATING NEWARK'S  
RECYCLING RATE**

1. Formula

- a) 
$$\frac{\text{Total Combined Solid Waste for 1982} + \text{Total Combined Recyclables for 1982}}{\text{Total Potential Solid Waste}}$$
- b) 
$$\frac{\text{Total Combined Recyclables for 1982}}{\text{Total Potential Solid Waste}} = \% \text{ of Recyclables from Newark's Waste Stream}$$
- c) 
$$15\% \times \text{Total Potential Solid Waste} = \text{State and Essex County Recycling Goals}$$

## 2. Figures

### a) Total Potential Solid Waste

226,432 tons/year	726 tons/day
<u>+13,482 tons/year</u>	<u>+ 43 tons/day</u>
239,914 tons/year	or 769 tons/day

### b) Percentage recycled from Waste Stream 1982

$$\frac{13,482 \text{ tons per year}}{239,914} = 5\%$$

### c) Recycling Goal

$$15\% \times 239,914 = 35,987 \text{ tons/per year}$$

$$15\% \times 769 = 115.35 \text{ tons/per day}$$

## 3.

- a) In 1982 Newark recycled 5% of its total potential solid waste stream or 43 tons per day.
- b) Newark's goal for recycling is 116 tons per day\* or 15% of the potential solid waste stream. This is consistent with both the State and County Recycling goals.

\*Figures based on extrapolations from 1982 City of Newark Sanitation Annual Report and the Port Authority's 1980 Composition and Weight Study of Municipal Solid Waste.

## A3-5 RECYCLING POTENTIALS

### FOR BUY-BACK RECYCLING CENTERS

#### 1. Assumptions

- a) A successful curbside program will recover 25% of the available recyclables the first year; 50% the second with marginal increases each year following. Drop off centers have recovered 15 to 25% of the available recyclables.

In the absence of documentation on recovery rates at redemption centers it will be assumed the incentive of cash for recyclables will increase volume of drop off centers, with 25% recovery rate in the first year and a 40% recovery in the second year.

- b) All tonnage should be divided among nine sites.
- c) Materials will be valued at the following prices:
  - 1. Newspapers @ \$35.00/ton
  - 2. Glass @ \$50.00/ton
  - 3. Aluminum @ \$400.00/ton
- d) Tons per day (TPD) will be based on a 6 day week or 312 days per year.

## 2. Observations

- a) Because of the economics of recycling, it is not conceivable that more than three new companies will evolve to operate nine redemption centers.
- b) According to the above calculations a 40% recovery rate of the available represents 5.2% of the waste stream, a lower representative diversion than similar models (i.e. R2B2). In as much as this equals 240 tons per week, the actual recovery rate is 1.75 times higher than that of R2B2.

### CHART A3-5a

#### CITY OF NEWARK'S CALCULATED RECYCLING POTENTIAL

ITEMS	NEWSPAPERS		GLASS		ALUMINUM		TOTALS	
AVAILABLE TONS (ANNUALLY)	13,244		15,260		2,341		30,845	
RECOVERY RATE (TONS)								
15%	1987		2289		315		4,591 TONS	
40%	4298		10,104		937		12,339 TONS	
ANNUAL VALUE								
15%	69,545		114,450		126,000		309,995 TONS	
40%	185,430		305,200		374,800		865,430 TONS	
TONS	15%	40%	15%	40%	15%	40%	15%	40%
Per Day	.59	.17	7.3	20	1	3	8.92	40
Per Week	3.6	102	43.8	120	6	18	54	240

Figures cited above based on:

1. Extrapolations from 1982 City of Newark Sanitation Annual Report and the Port Authority's 1980 Composition and Weight Study of Municipal Solid Waste.
2. A Collection Schedule of 312 days per year (6 days per week).

### A3-6 DETERMINING REFUSE TRANSPORTATION COSTS

#### I. City Refuse Vehicles

1. Hold an average of 23.33 cubic yards(5.8 tons per trip of refuse)
2. Bulk Collection Trucks hold 14 cubic yards(3.5 tons per trip)

#### II. Municipal Waste Removed \*

1. Refuse 357,427 cubic yards or 89,356.75 tons
2. Bulk: 7,251 cubic yards or 1,812.75 tons

### III. Trips to the Dump \*

#### 1. Formulas

$$\frac{\text{a) Refuse Truck Volume}}{\text{Refuse Volume}} = \frac{\text{\#Trips to dumpster}}{\text{Refuse Disposal}}$$

$$\frac{\text{b) Bulk Truck Volume}}{\text{Bulk Volume}} = \frac{\text{\#Trips to dumpster}}{\text{Refuse Disposal}}$$

#### 2. Calculations

$$\text{a) } \frac{357,427}{23.33} = 15,320.48 \text{ Trips for refuse disposal}$$

$$\text{b) } \frac{7,251}{14} = 517.92 \text{ Trips for Bulk refuse disposal}$$

#### c) Total Trips

REFUSE	15,230
BULK	518
TOTAL	<u>15,838</u>

### IV. City Refuse/Bulk Vehicles Costs \*

Personnel	\$2,715,829.22
Fringe Benefits	\$ 973,936.87
Other than Personnel	\$ 160,495.43
Vehicle Operations	\$ 469,488.57
Vehicle Depreciation	\$ 146,182.64
TOTAL	<u>\$4,471,932.73</u>

### V. Vehicle Depreciation Cost Per Trip (Municipal Disposal)

#### 1. Formula:

$$\frac{\text{Bulk/Refuse Vehicle Costs}}{\text{Trips to dump}} = \text{Cost Per Vehicle Trip}$$

#### 2. Calculation:

$$\frac{4,471,932.73}{15,838} = \$282.35 \text{ Cost Per Trip to Dump}$$

\* Information based on "A Study of Newark, New Jersey's Refuse Collection System: A Comparison between Municipal and Connect Service Phase II - July 1980" - June 1981, pg 6,21

### A3-7 THE CITY OF NEWARK'S CREDIT FOR MATERIALS RECYCLED UNDER CONTRACT FOR WASTE COLLECTION

Amount of monthly decrease in cost of contractor per ton of recycled materials (i.e. paper, glass, metals) collected by the City and/or its agent(s).

1-500	Tons Recycled by the City and/or its agent(s)	
1.	48 months (4 years)	<u>\$5.00</u> per ton credit
2.	60 months (5 years)	<u>\$5.10</u> per ton credit
501-1000	Tons Recycled by the City and/or its agent(s)	
1.	48 months (4 years)	<u>\$5.25</u> per ton credit
2.	60 months (5 year)	<u>\$5.35</u> per ton credit
1001-1500	Tons Recycled by the City and/or its agent(s)	
1.	48 months (4 years)	<u>\$5.50</u> per ton credit
2.	60 months (5 years)	<u>\$5.75</u> per ton credit
1501-2000	Tons Recycled by the City and/or its agent(s)	
1.	48 months (4 years)	<u>\$6.00</u> per ton credit
2.	60 months (5 years)	<u>\$6.25</u> per ton credit
Over 2000	Tons Recycled by the City and/or its agent(s)	
1.	48 months (4 years)	<u>\$6.50</u> per ton credit
2.	60 months (5 years)	<u>\$6.75</u> per ton credit

Credit for recyclables noted in Contract #82-22, between the City of Newark and James Petrozello, Inc., for the collection of refuse in 1/3 of the City of Newark. The other 2/3 of the City are collected by the City.

### A3-8 HIGH-GRADE PAPER CALCULATIONS

- According to the Newark Chamber of Commerce the white collar workers in Newark breaks down as follows:

Finance Associations, Real Estate	16,000 jobs
Small Services and Amusements	26,000 jobs
Retail Trade	<u>15,000 jobs</u>
Total	57,000 jobs
- For purposes of high grade calculations, the Chamber suggest we use a figure of 25,000 ledger paper producers.



3. EPA estimates bank & insurance operations employees each produce 2.31 lbs. of waste per day 93% of which or 2.17 lbs. per day is paper. EPA general office surveys showed the production of 1.55 lbs. waste per day, per employee 85% of which or 1.32 lbs. is paper.
4. Based on average of bank, insurance and general office employees it will be assumed that Newark's white collar workers produce an average of 1.74 lbs per person per day, or a total 4.35 lbs for a 5 days week --- 50 weeks/year.
5.  $435 \text{ lbs.} \times 25,000 \text{ workers} \times 250 \text{ days} = 10,875,000 \text{ lbs.}$  or 5,437.50 tons per year.
6. City of Newark ----- 3910 total employees 1096 white collar workers  $\times 435 \text{ lbs/yr.} = 476,760 \text{ lbs}$  or 238.38 tons per year.

**RECYCLING ORIENTED GRANT AWARDS  
PRESENTED TO THE CITY OF NEWARK, N.J.**

**TONNAGE GRANT AWARDS**

YEAR	RES. # TO MAKE OR RATIFY SUBMITTAL OF GRANT APPL.	TONS RECYCLED	MUN. TONNAGE GRANT AWARD \$	DATE OF BUDGET INSERTION RES.	RES. # ACCEPTING GRANT AWARD
1984	-----	15,863.10	\$47,190.80 \$15,640.68 \$ 4,658.78	7RN030586 7RCD062586 7RBY050786	7RB021986 7RBC062586 7RU052186
1983	7RV021584	22,289.00	\$33,391.97	7RW062585	7RBA060585
1982	7RZ031683	13,304.50	\$86,134.50 \$17,210.43 \$ 8,515.62	7RBM040484 7RBM092183 7RC0080785	7RU021584 7RU021584 7RCP080785

**PROGRAM PLANNING GRANT AWARDS (reimbursable)**

YEAR	RES. # TO MAKE OR RATIFY SUBMITTAL OF GRANT APPL.	AMOUNT REQUESTED	AMOUNT AWARDED	RES. # ACCEPTING GRANT AWARD	DATE CONTRACT EXECUTED	STATE CONTRACT #
1984	7RU091984	\$ 94,620.00	\$32,820.00	7RI030586	04/07/86	#85-90 REC II
1982	7RF102082	\$128,332.00	\$11,000.00	7RC(A.S.)031683	06/13/83	#83-21-REC II

**PROGRAM EDUCATION GRANT AWARDS (reimbursable)**

1984	7RU091984	\$ 94,620.00	\$11,800.00	7RK030586	05/01/86	#85-91 REC III
1982	7RF102082	\$128,332.00	\$ 5,000.00	7RC(A.S.)031683	06/13/83	#83-22-REC III

**VICTORIA FOUNDATION GRANT**

1982	7RH010583	\$10,000.00	\$10,000.00
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**NATURAL RESOURCES BOND ACT**

1982	\$190,922.00	\$190,922.00
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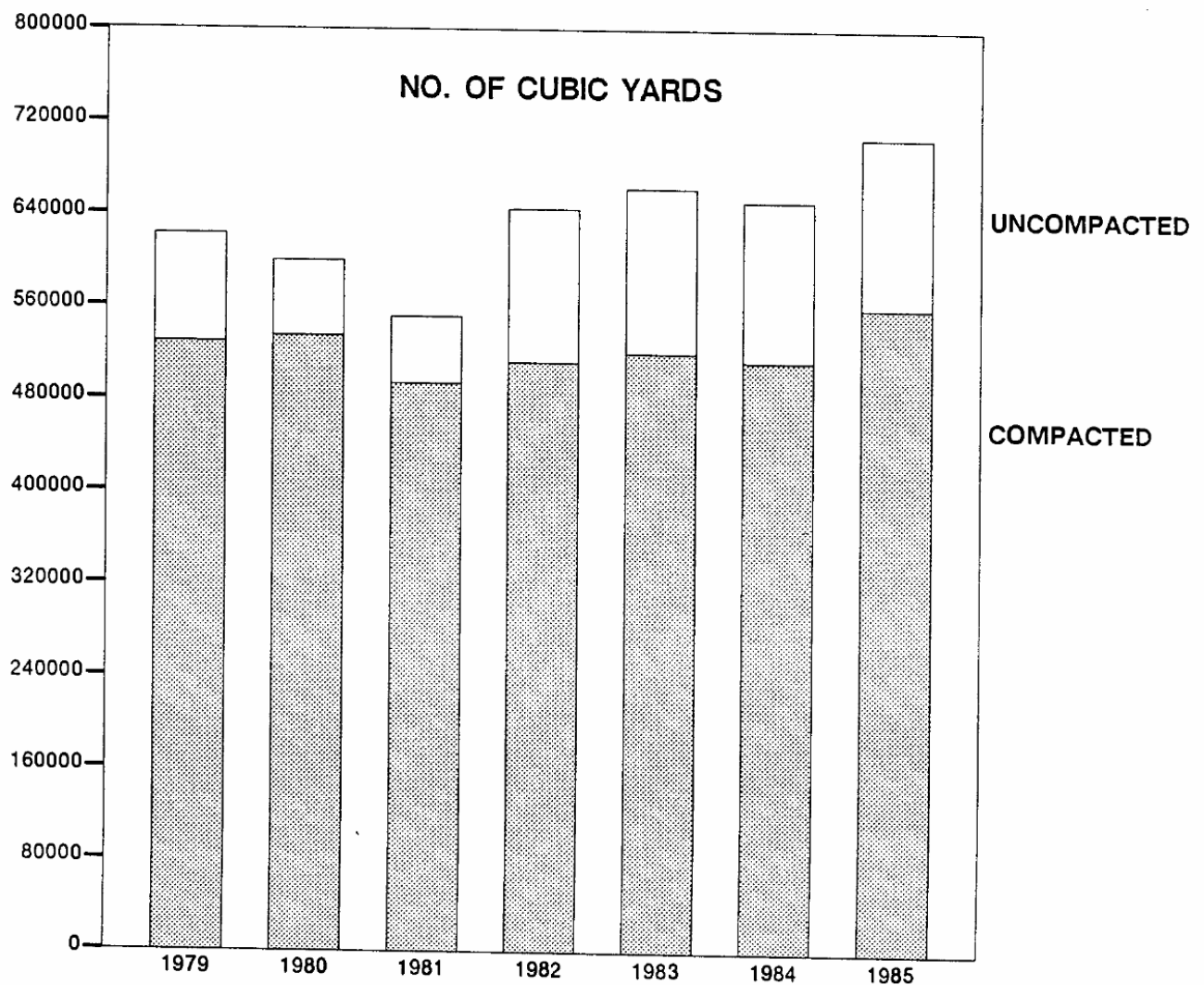
GRAND TOTAL: \$474,284.78

# MUNICIPAL SOLID WASTE DISPOSAL CITY OF NEWARK

## NUMBER OF CUBIC YARDS COLLECTED BY THE CITY AND ITS CONTRACTOR\*

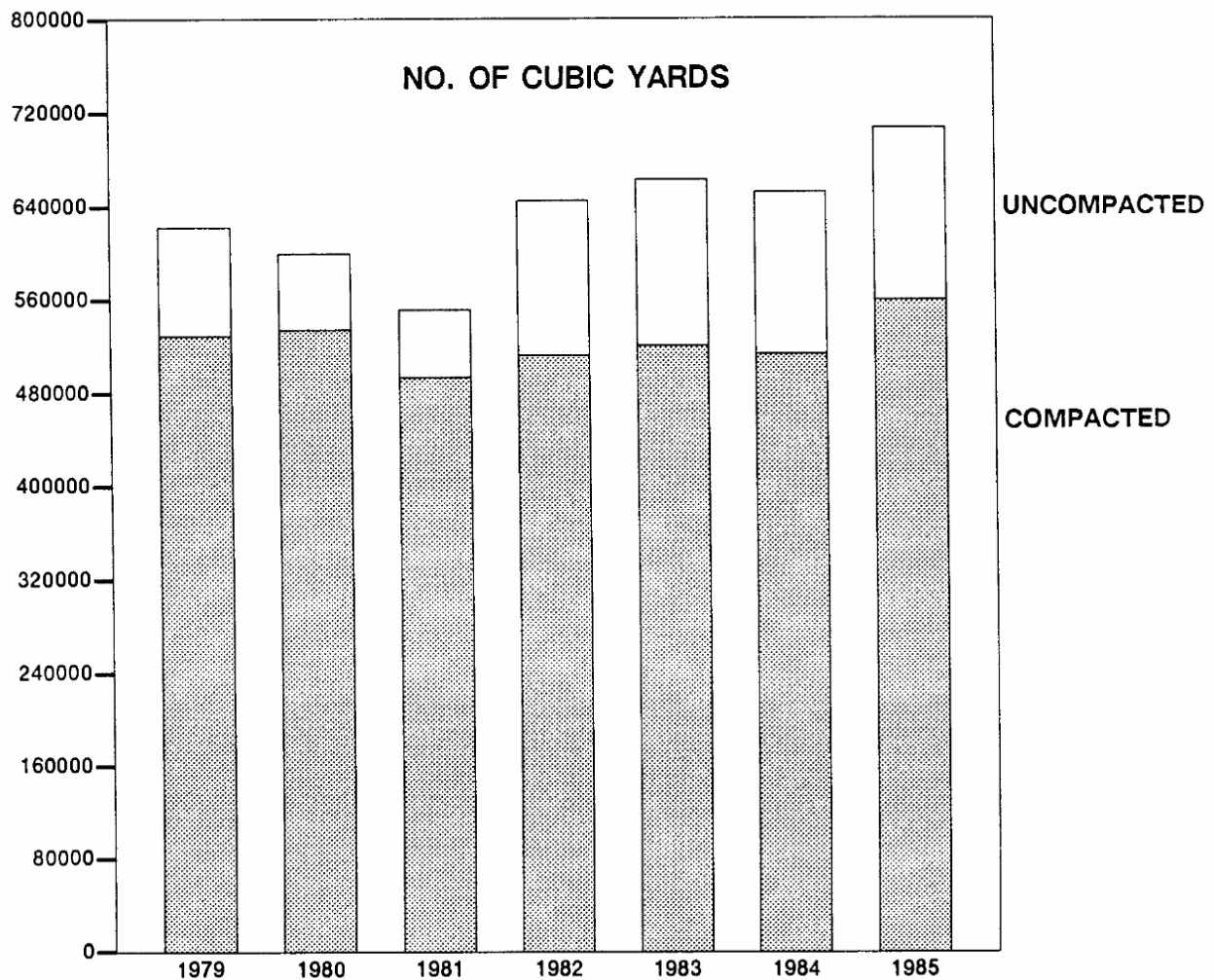
YEAR	COMPACTED	UNCOMPACTED	TOTAL
1979	529,446	93,610	623,056
1980	534,521	65,332	599,853
1981	493,676	57,631	551,307
1982	512,544	132,511	645,055
1983	520,721	142,473	663,194
1984	513,668	138,407	652,075
1985	559,768	147,381	707,149

\* These figures do not include refuse collected from the City of Newark by private refuse collection companies.



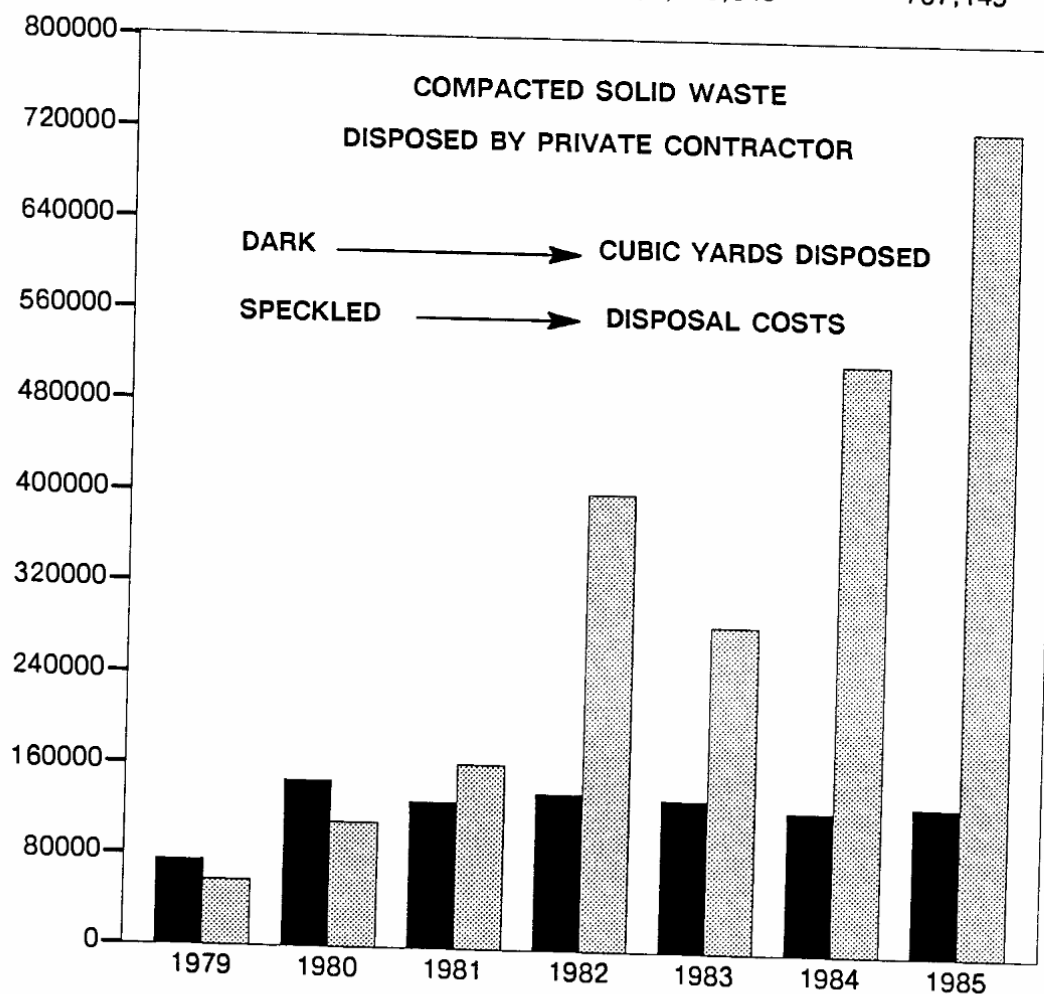
**CITY OF NEWARK  
DISPOSAL OF SOLID WASTE  
[BOTH COMPACTED AND UNCOMPACTED]**

YEAR	DISPOSED BY PRIVATE CONTRACTOR		DISPOSED BY THE CITY		TOTAL DISPOSED	
	CUBIC YARDS	COST	CUBIC YARDS	COST	CUBIC YARDS	COST
1979	75,110	\$ 57,344	547,946	\$ 426,933	623,056	\$ 484,276
1980	146,398	\$109,799	453,455	\$ 340,091	599,853	\$ 449,890
1981	128,643	\$162,106	422,664	\$ 525,951	551,307	\$ 688,057
1982	138,144	\$401,617	506,911	\$ 732,589	645,055	\$1,134,206
1983	134,152	\$287,086	528,998	\$1,132,056	663,150	\$1,419,142
1984	125,099	\$518,313	526,976	\$2,323,492	652,075	\$2,841,805
1985	131,042	\$724,663	576,107	\$2,500,540	707,149	\$3,225,203



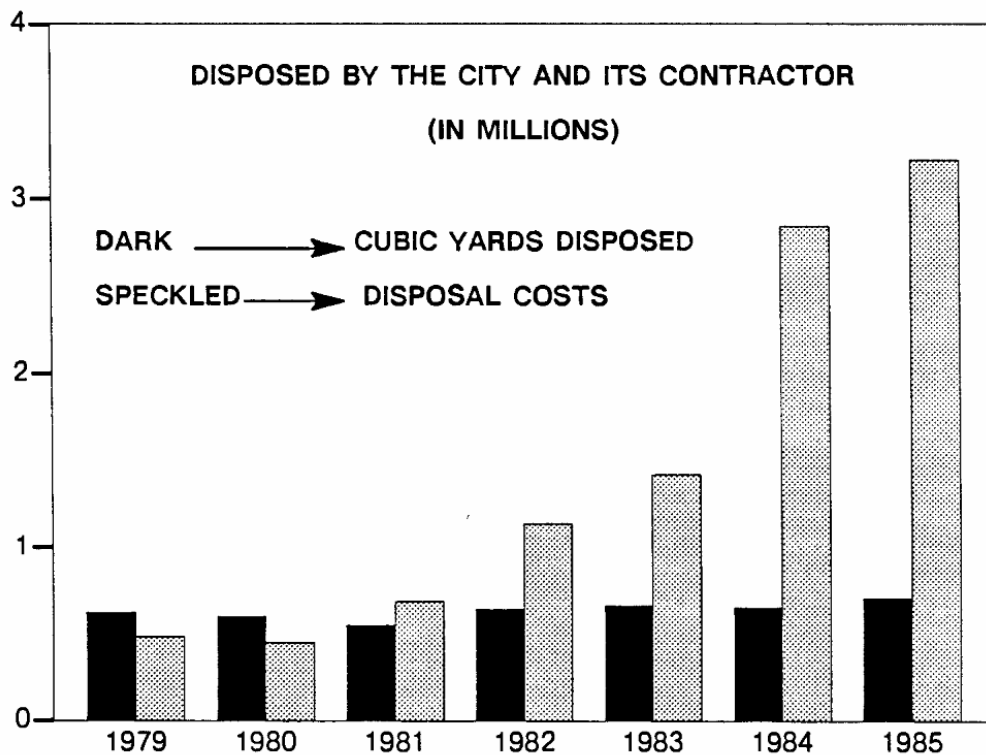
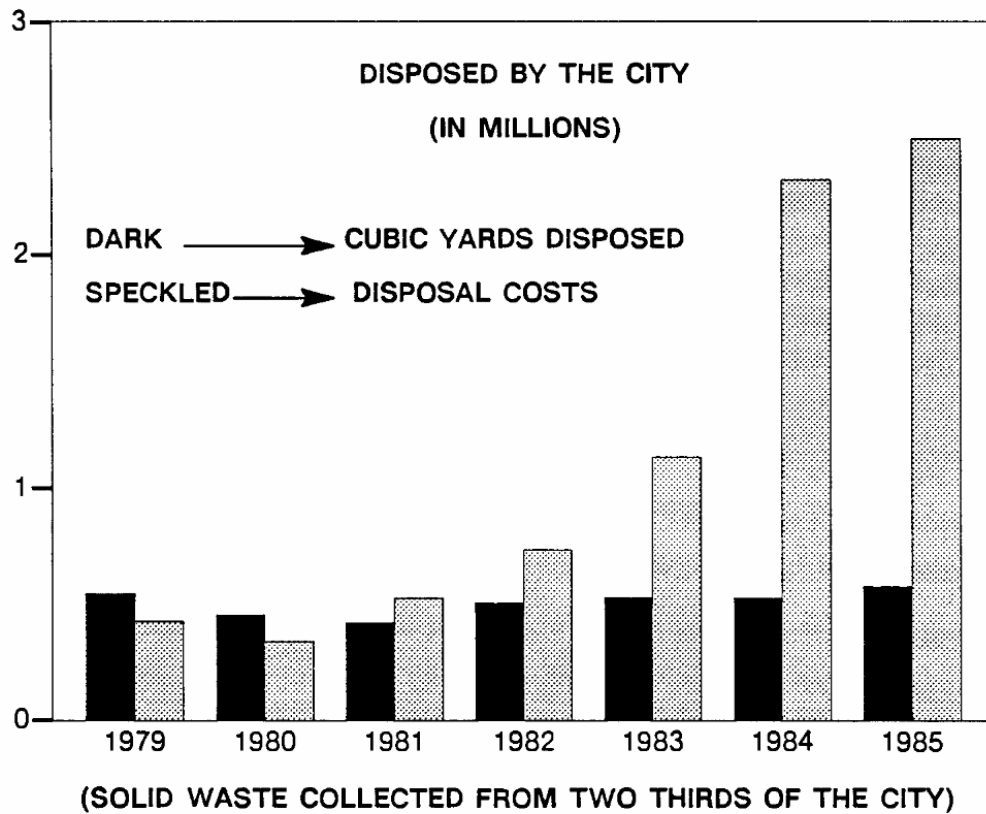
**CITY OF NEWARK  
DISPOSAL OF SOLID WASTE  
[BOTH COMPACTED AND UNCOMPACTED]**

YEAR	DISPOSED BY PRIVATE CONTRACTOR		DISPOSED BY THE CITY		TOTAL DISPOSED	
	CUBIC YARDS	COST	CUBIC YARDS	COST	CUBIC YARDS	COST
1979	75,110	\$ 57,344	547,946	\$ 426,933	623,056	\$ 484,276
1980	146,398	\$109,799	453,455	\$ 340,091	599,853	\$ 449,890
1981	128,643	\$162,106	422,664	\$ 525,951	551,307	\$ 688,057
1982	138,144	\$401,617	506,911	\$ 732,589	645,055	\$1,134,206
1983	134,152	\$287,086	528,998	\$1,132,056	663,150	\$1,419,142
1984	125,099	\$518,313	526,976	\$2,323,492	652,075	\$2,841,805
1985	131,042	\$724,663	576,107	\$2,500,540	707,149	\$3,225,203



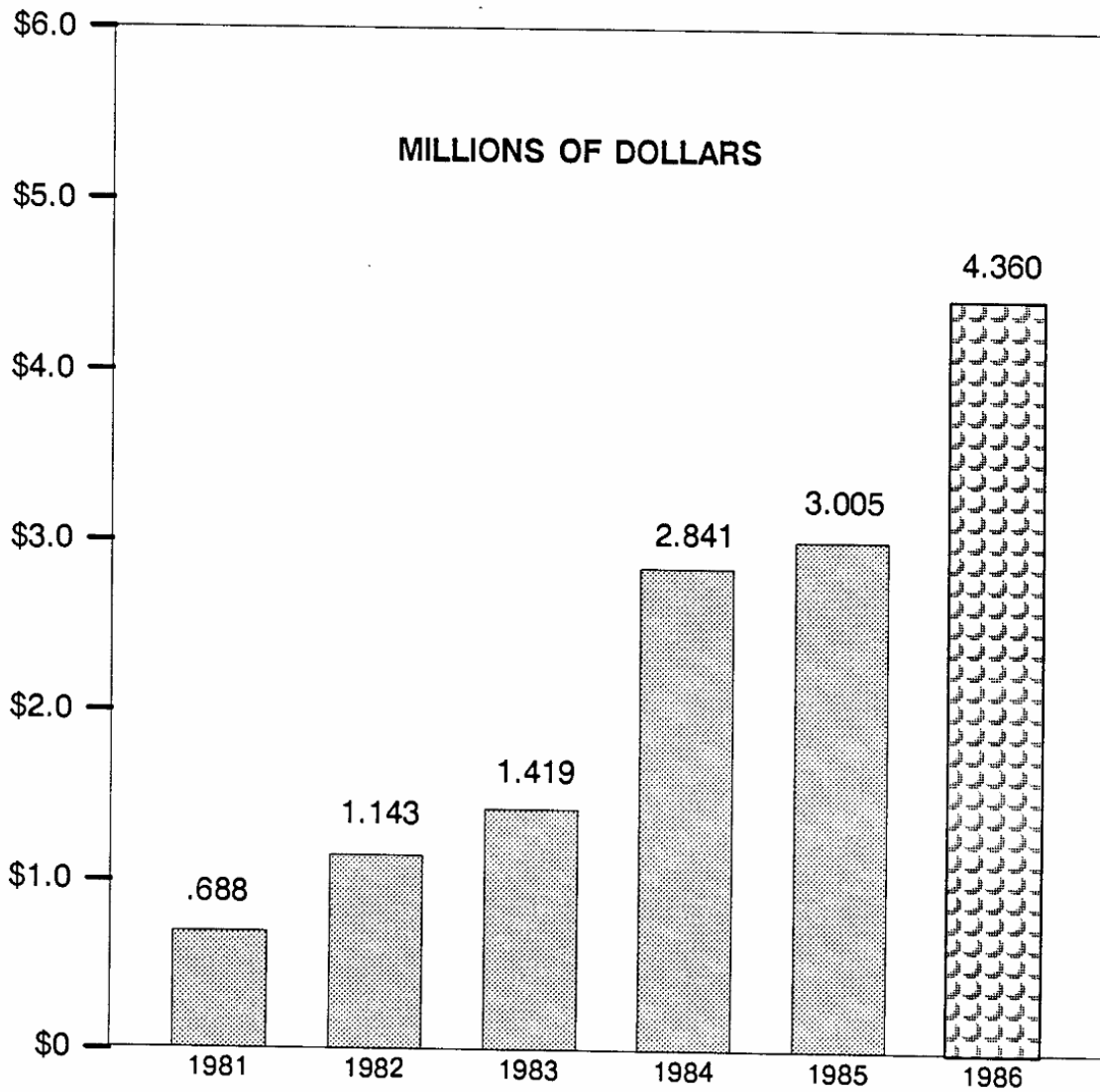
(SOLID WASTE COLLECTED FROM ONE THIRD OF THE CITY)

**CITY OF NEWARK  
ALL SOLID WASTE (COMPACTED AND UNCOMPACTED)**



**CITY OF NEWARK  
SOLID WASTE DISPOSAL COSTS**

YEAR	AMOUNT SPENT
1981	\$ 688,000.
1982	1,143,000.
1983	1,419,000.
1984	2,841,000.
1985	3,005,000.
1986 (PROJECTED)	4,360,000.



**1986<sup>3</sup> PROJECTED MUNICIPAL SOLID WASTE (MSW)  
DISPOSAL COSTS FOR THE CITY OF NEWARK**

<b>I. 1986 Projected Disposal Cost</b>	<b>Compacted Refuse</b>	<b>Uncompacted Refuse</b>	<b>Subtotal</b>	<b>Total</b>
A. Disposal Charge <sup>2</sup> with HMOC Rate Averaging	(513,668 C.Y. <sup>1</sup> at \$4.83/C.Y.) <sup>2</sup> \$2,481,016	+ (138,407 C.Y. at \$4.86/C.Y.) \$672,658	= \$3,153,674	
B. Landfill Closure Tax (P.L. 1981, Chapter 306)	(513,668 C.Y. at \$.45/C.Y.) \$231,151	+ (138,407 C.Y. at \$.45/C.Y.) \$62,283	= 293,434	
C. Recycling Tax (P.L. 1981, Chapter 278)	(513,668 C.Y. at \$.12/C.Y.) \$61,840	+ (138,407 C.Y. at \$.12/C.Y.) \$16,609	= 78,249	
D. Service Tax (P.L. 1981, Chapter 38)	(513,668 C.Y. at \$.15/C.Y.) \$77,050	+ (138,407 C.Y. at \$.15/C.Y.) \$20,761	= 97,811	
E. Resource Recovery Tax (P.L. 1981, Chapter 38)	(513,668 C.Y. at \$.30/C.Y.) \$154,100	+ (138,407 C.Y. at \$.30/C.Y.) \$41,522	= 195,622	
F. Importation Tax (P.L. 1981, Chapter 38)	(513,668 C.Y. at \$.30/C.Y.) \$154,100	+ (138,407 C.Y. at \$.30/C.Y.) \$41,522	= 195,622	
G. Host Community Tax (P.L. 1981, Chapter 38)	(513,668 C.Y. at \$.52/C.Y.) \$267,107	+ (138,407 C.Y. at \$.52/C.Y.) \$71,972	= 339,079	
H. County Environmental Health Act Tax (P.L. 1981, Chapter 438)	(513,668 C.Y. at \$.01/C.Y.) \$5,137	+ (138,407 C.Y. at \$.01/C.Y.) \$1,384	= 8,521	
	\$3,431,301	+ \$928,711	= (1986 Projected)	\$4,360,012
			(1985 Projected)	\$3,005,164
	<b>Compacted (C.Y.)</b>	<b>Uncompacted (C.Y.)</b>	<b>Total</b>	
	513,668	138,407	651,075	(1984 Actual) \$2,841,805
	520,677	142,473	663,150	(1983 Actual) \$1,419,142
	512,544	132,511	645,055	(1982 Actual) \$1,143,206
	493,676	57,631	551,307	(1981 Actual) \$ 688,057

<sup>1</sup>Utilizing 1984 disposal quantities

<sup>2</sup>Assuming Board of Public Utilities (BPU) approval of the requested HMDC rate effective October 1, 1985

<sup>3</sup>As of August 26, 1985. Prepared by the Newark Department of Engineering



## SANITARY LANDFILL DATA

	1985
REFUSE (C.Y.)	428,776
BULK (C.Y.)	28,430
STREET CLEANING MANUALLY (C.Y.)	18,100
STREET CLEANING MOTOR BROOMING (C.Y.)	42,320
TREES, LEAVES, BRUSH, BRANCHES	23,238
LOTS, CLEAN UP PROGRAMS, BULK, DEBRIS	35,243
Total	576,107 c.y.

## PRIVATE CONTRACTOR (C.Y.)

PETROZELLO	131,042
* PINTO	19,863

## LANDFILL FEES

	CUBIC YARDS	(\$ )TOTALS
CITY	576,107	\$2,500,540
PRIVATE	131,042	\$ 724,663
		\$3,225,203

\* Pays Own Dump Fees

## APPENDIX 4

### Attributes of businesses accepting recyclables in the Newark metropolitan area.

#### INDUSTRIES WITH ADDITIONAL CAPACITY FOR RECYCLABLES

##### (LOCAL DEMAND)

**Alumet Corporation:** a smelter producing nearly three million pounds of finished ingot per month. The ingot is shipped for use in and around Newark. Alumet is a buyer of aluminum scrap and UBC.

**Newark Group, Inc.:** parent company of Newark Boxboard, Recycled Fibers Co. of New Jersey, and North Shore Fibers of Massachusetts. Newark Group buys OCC for their own local production, for their production mills in New England and the South, and for export.

**Proctor and Gamble, Inc. of Staten Island:** fires the boiler for its Ivory Soap plant with waste wood. Proctor and Gamble is particularly interested in increasing the amount of chipped wood waste it receives.

**Garden State Paper, of Garfield, NJ:** buys high-grade newsprint.

**Flowen Oil, Camden:** a re-refiner, interested in purchasing used crankcase oil from service stations and fleets.

**Petrocon, Inc. of PA:** in connection with a program to benefit the Muscular Dystrophy Association, works with service stations to purchase used crankcase oil in New Jersey.

**Distributors Recycling Inc., Newark:** purchases glass, OCC, and aluminum beverage containers from the New York beverage industry. Although its ability to take additional glass is uncertain, the company may be able to buy OCC and aluminum UBC in large quantities.

**Alcoa Recycling, Inc.:** is aggressively setting up centers to purchase aluminum UBC from residents. Alcoa works with community groups, and has recently opened its own buyback center at the corner of Bloomfield and Summer Avenues in Newark.

**BASR Industries:** a scrap and salvage operation, which purchases nonferrous metals and plastic. Serving primarily export markets, BASR could increase its capacity. In an interview, BASR's president, Barry Zamilsky, has offered his assistance to the City to set up buyback centers in the community to feed his operation.

A number of paper stock brokers in the area, including Ragonese & Sons Paper, P. Pepe & Sons, and Arrow Paper Co. can accept as much high-grade ledger paper as can be made available.

##### EXPORT DEMAND

##### Export Brokers

**Engineered Waste Control** (contact: Fritz Sparks, 415-841-7200)

**Ecolo-Haul** (contact: Gary Petersen, 213-454-3845)

**National Salvage Company** (contact: Robert D'Amore, 609-927-6400)

**Commercial Waste Recycling Systems, Inc.** (contact: David Croce, 215-855-3775)

**Recycling Enterprises** (contact: Murray Fox, 800-343-0587)

**Container Corporation of America** (contact: Purchasing Agent, 202-463-7470)

**Puerto Rico Marine Management** (contact: H.L. Lewis, 809-583-7100).

## APPENDIX 5

### SALVAGE AND RECLAMATION SECTOR

#### SCRAP METALS

A-1 Industrial Scrap 278 Seacaucus Road Seacaucus, New Jersey	C & G Waste Disposal/C & G Waste Paper Company 108 Malvern Street Newark, New Jersey
Ace Metal Alloys Company 561 Ferry Street Newark, New Jersey	Calumet Sales Company, Inc. 23 Hyatt Avenue Newark, New Jersey
Ace Surplus Company, Inc. 74 Passaic Street Newark, New Jersey	Coleman Thos. 13 Ferdon Street Newark, New Jersey
Alumet Smelting Corporation 104 Easr Peddie Street Newark, New Jersey	Franklin Metals Company 1261 Avenue of the Americas New York City, New York
Arthur Ames Scrap Metal 1068 Clinton Avenue Irvington, New Jersey	Fred M. Reis Metals Company 357 Wilson Avenue Newark, New Jersey
Atlas Non-Ferris Metals, Inc. 46 Stanton Street Newark, New Jersey	Frema, Inc. 338 Wilson Avenue Newark, New Jersey
B & T Metals 56-6 Avenue C Newark, New Jersey 07105	Frema Smelting & Refining Company, Inc. 7 Avenue L Newark, New Jersey
BASR Industries 327 Frelinghuysen Avenue Newark, New Jersey	G & S Cast Company 115-121 Riverside Avenue Newark, New Jersey
Bart Metals, Inc. 960 Frelinghuysen Avenue Newark, New Jersey	G & S Motor Equipment Company 1800 Harrison Avenue Kearny, New Jersey
Bergen Metal Company Ft. of Bergen Avenue Kearny, New Jersey	Garfield Scrap Metals, Inc. 802 Garfield Avenue Jersey City, New Jersey
Bickoff L. Scrap Iron & Metal Company 199 Oraton Newark, New Jersey	Gartenburg, Jos. 489 Frelinghuysen Avenue Newark, New Jersey
Brady Iron & Metal 55 Lockwood Street Newark, New Jersey	Goldberg, Harry & Sons 2nd and Lewis Perth Amboy, New Jersey

Goldmet Corporation  
325 Frelinghuysen Avenue  
Newark, New Jersey

H & C Metals, Inc.  
87-93 Malvern Street  
Newark, New Jersey 07105

Harrison Steel & Metal Company  
308 - First Street  
Harrison, New Jersey

Hirsch, Benj. & Company  
561 Ferry Street  
Newark, New Jersey

Hirsch & Moscovitz Corporation  
435 Frelinghuysen Avenue  
Newark, New Jersey

Hodapp, H.  
176 Milburn Avenue  
Milburn, New Jersey

Hoffman, Louis and Company  
327 Frelinghuysen Avenue  
Newark, New Jersey

Hull, Chas. P. Company, Inc.  
Porete Avenue  
North Arlington, New Jersey

Independent Iron & Metal Company  
400 Jersey Avenue  
New Brunswick, New Jersey

Interstate Concentrating Company, Inc.  
275 Dukes  
Kearny, New Jersey

Interstate Metals Separating Corporation  
275 Dukes  
Kearny, New Jersey

Irvinton Metals Company, Inc.  
601 New Point Road  
Elizabeth, New Jersey

J & J Metals, Inc.  
489 Frelinghuysen Avenue  
Newark, New Jersey

Kearny Scrap Metal  
478 Schuyler Avenue  
Kearny, New Jersey

Klein S. Metal Company, Inc.  
2156 Camplain Road  
Somerville, New Jersey

Kuhl J. Metals Company  
24 Ann Street  
Kearny, New Jersey

L & B Metals, Inc.  
1601 Edgar Road  
West Linwood, New Jersey

Louis Usdin Company, Inc  
International Way  
Newark, New Jersey

Lowenstein Metals, Inc.  
225 Clifford  
Newark, New Jersey 07103

Lowenstein, Norman, Inc.  
901 East Brand  
Elizabeth, New Jersey

MTA Shredding Corporation  
128 Frontage Road  
Newark, New Jersey

Matonis Scrap Metals Company  
(for buyers)  
45 John Hay Avenue  
Kearny, New Jersey

Matonis Scrap Metals Company  
(for dealers)  
714 Warren Street  
Harrison, New Jersey

Maxnor Metals Company  
225-237 Ridgewood Avenue  
Newark, New Jersey

Metal and Ferrous Recovery  
225-239 Ridgewood Avenue  
Newark, New Jersey

Nadco Metals Company  
206 Vanderpool Street  
Newark, New Jersey

Naparano Iron & Metal Company  
Ft. of Hawkins Street  
Newark, New Jersey

New Point Scrap  
551 New Point Road  
Elizabeth, New Jersey

Nimco Shredding Company  
214-252 Doremus Avenue  
Newark, New Jersey 07105

PNN Contractors  
1 Fish House Road  
Kearny, New Jersey

PNN Contractors  
4 Sylvia Place  
North Arlington, New Jersey

Paper & Metal Recycling & salvage  
Corporation  
Frelinghuysen Avenue  
Newark, New Jersey

Park Stein, Inc.  
201 Market Street  
Passaic, New Jersey

Posner Battery Dist.  
25 Concord Street  
Newark, New Jersey

Ramco  
185 Foundry Street  
Newark, New Jersey

Reis, Fred M.  
357 Wilson Avenue  
Newark, New Jersey

Rover, F. & Son  
516 Central Avenue  
Harrison, New Jersey

Schiabo Corporation  
8 - 18 Noble Street  
Newark, New Jersey 07105

Schiavone Bonomo Corporation  
Ft. of Jersey Avenue  
Jersey City, New Jersey

Schroth, Emil A., Inc.  
Yellow Brook Road and Cooper Avenue  
Howell, New Jersey

Scrap Iron & Metal Company  
Mr. Leon Bickoff  
199 Oraton Street  
Newark, New Jersey

Sepenuk, J. & Sons, Inc.  
21 Hyatt Avenue  
Newark, New Jersey

Steelmet, Inc.  
1 Marlin Street  
Newark, New Jersey

Tidewater Baling Corporation  
26 St. Charles Street  
Newark, New Jersey

Usdin Louis Company, Inc.  
Foot of International Way  
Newark, New Jersey

Weissman, I.  
52 Livingston Street  
Newark, New Jersey

Woodstein, M.  
91 Malvern Street  
Newark, New Jersey

Young Recycling, Inc.  
960 Frelinghuysen Avenue  
Newark, New Jersey

Zamelsky, Jos. B. Company, The  
313 Frelinghuysen Avenue  
Newark, New Jersey

## SCRAP RUBBER

A & B Scrap Rubber  
200 Raymond Boulevard  
Newark, New Jersey

Terminal Rubber Company  
280 Avenue P  
Newark, New Jersey

T & M Tire Company  
200 Raymond Boulevard  
Newark, New Jersey

## SCRAP PLASTICS

Amco Plastic Materials, Inc.  
5958 Broadhollow Road  
Farmingdon, New York

B & K Plastics Recycling  
50 Grace  
Irving, New Jersey

Bamberger, Claude P., Inc.  
111 Paterson Plank Road  
Crist, New Jersey

Empire Polymer Corporation  
1400 Rahway Avenue  
Avondale, New Jersey

Folber Plastics Company  
1000 South 4th  
Hudson, New Jersey

Jerochem Corporation  
160 Passaic Avenue  
Kearny, New Jersey

Monoplast Chemical Corporation  
106 Rutherford  
Newark, New Jersey

Passaic Waste & Trading Company  
681 Main Boulevard  
Passaic, New Jersey

Ronald Mark Associates, Inc.  
1227 Central Avenue  
Hillside, New Jersey

Simplastics  
55 Arlington Avenue  
Kearny, New Jersey

T D Plastics  
370 Orange Street  
Newark, New Jersey

## SURPLUS & SALVAGE MERCHANDISE

Ace Surplus Company, Inc.  
74 Passaic Street  
Newark, New Jersey

Air, Land & Sea Surplus & Salvage  
Company  
164 Centre  
Newark, New Jersey

American Hardware Salvage Company  
927-S-18th  
Newark, New Jersey

Atlanta Feed Products, Inc.  
Bakery Wastes & By-Products  
286 Seacaucus Road  
Seacaucus, New Jersey

Camarato Trucking  
26 Richards  
Newark, New Jersey

Delta International Marketing Company,  
Inc.  
940 Newark Avenue  
Elizabeth, New Jersey

Expert Sales and Salvage, Inc.  
95 North 11th  
Newark, New Jersey

Guarino, Daniel  
1373 McCarter Highway  
Newark, New Jersey

R & R Salvage  
110 6th Street  
West Plainfield, New Jersey

Titan Surplus, Inc.  
300 U.S. Highway 1 & 9  
Newark, New Jersey

## **AUTOMOBILE RECYCLERS**

All Star Auto Wreckers  
26 Avenue C  
Newark, New Jersey 07105

Angelo Devino  
44 Ball Street  
Newark, New Jersey 07105

Astor Motors  
50-4 Avenue C  
Newark, New Jersey 07105

B & C Towing  
461 Avenue  
Newark, New Jersey

Battista & Cost  
563 Wilson Avenue  
Newark, New Jersey 07105

Cee Cee Auto Sales  
329 Doremus Avenue  
Newark, New Jersey 07105

Central Auto Wreckers  
66 Avenue C  
Newark, New Jersey 07105

Dewey's Garage, Inc.  
338 Wilson Avenue  
Newark, New Jersey 07105

Domenick's Auto Wreckers  
543 Avenue P  
Newark, New Jersey 07105

East Coast Truck Parts  
810 Frelinghuysen Avenue  
Newark, New Jersey 07114

Garden State Auto Salvage  
413 Wilson Street  
Newark, New Jersey 07105

J & J Auto Wreckers  
587-93 Third Street  
Newark, New Jersey 07107

M & J Towing  
Harold McLeon  
426-478 Wilson Avenue  
Newark, New Jersey 07105

S N S Auto Sales  
553 Avenue P  
Newark, New Jersey 07105

Stadium Auto Wreckers  
553 Avenue P  
Newark, New Jersey 07105

## **PAPER RECYCLERS**

E. Salerno & Sons  
325 Chestnut Street  
Newark, New Jersey 07105

Industrial Scrap Hauling, Inc  
217 Poinier Street  
Newark, New Jersey 07102

Paper Recycling Corporation  
145 Manchester Place  
Newark, New Jersey 07104

Patsy Ragonese & Sons, Inc  
331-337 Adams Street  
Newark, New Jersey 07105

R & S Waste Paper  
354 Adams Street  
Newark, New Jersey 07105

R & S Waste Paper  
98-100 Clifford Street  
Newark, New Jersey 07105

Recycled Fibers Corporation  
60 Lockwood Street  
Newark, New Jersey 07105

Recycling & Salvage Service, Inc  
Frelinghuysen Avenue  
Newark, New Jersey 07114

## OTHER RECYCLERS REGISTERED WITHIN THE CITY OF NEWARK

Alexander & Sons, Inc.  
194-210 Jelliff Avenue  
Newark, New Jersey

Alpha Chemical  
1-23 Jabez Street  
Newark, New Jersey 07105

Carlo & Lorenzo  
39-41 Hamilton Street  
Newark, New Jersey 07105

G. Conselyea  
195 Vanderpool Street  
Newark, New Jersey

Costa & Gignatino Waste Disposal  
108 Malvern Street  
Newark, New Jersey 07105

Roy Disque  
310 Avenue P  
Newark, New Jersey 07105

Andrew & Theodore Fiore & Sons  
272-279 Doremus Avenue  
Newark, New Jersey 07105

Anthony Fiore and Sons  
196-216 Delancy Street  
Newark, New Jersey 07105

Gundy Brothers  
300-312 Badger Avenue  
Newark, New Jersey

Ragelio Hernandez  
156 Miller Street  
Newark, New Jersey 07105

Mr. L. Kurman  
35-53 Stockton Street  
Newark, New Jersey 07105

Allen Nappi  
17-31 Avenue L  
Newark, New Jersey 07105

Newark Wrecking and Export  
75 Lockwood Street  
Newark, New Jersey 07105

Nimco Shredding Company  
570 Doremus Avenue  
Newark, New Jersey 07105

Nimco Shredding Company  
110 Evergreen Avenue  
Newark, New Jersey

Nimco Shredding Company  
127 Doreums Avenue  
Newark, New Jersey 07105

Mr. David Reynolds  
60 Rear Chapel Street  
Newark, New Jersey 07105

South Street Salvage  
320-8 South Street  
Newark, New Jersey 07105

Mr. Louis Verrone  
308-310 South Street  
Newark, New Jersey 07105



## **APPENDIX 6**

### **LIST OF RECYCLING CONTACTS**

#### **MULTIMATERIAL RECOVERY**

##### **Neighborhood Buyback Recycling Center**

###### **Contacts:**

Re: Resource Recovery Bronx Boro (R2B2) (for profit subsidiary/nonprofit): Mike Schedler, 1809 Carter Avenue, Bronx, New York 10457 (212) 731-8666.

Re: Resource Center (nonprofit) Gretchen Brewer, Development Officer, 949 West Armitage, Chicago, Illinois 60614 (212) 248-8683.

Re: National Temple Recycling (for profit): Rudy Tolbert, Project Director, 1625 West Master, Philadelphia, PA 19121 (215) 223-1140.

Re: A & P Paper Stock (for profit) Pat and John Bastardo 48 S. 20th Street, Irvington, New Jersey (201) 374-1750.

Re: Zozzaro Industries (for profit) John Zozzaro, 36 Chestnut Street, Clifton, New Jersey 07011 (201) 772-0253.

##### **Glass Markets**

###### **Contact:**

Robert Donovan, Owens-Illinois, Inc., Park 80 Plaza West One, Saddle Brook, New Jersey 07662. (deceased)

##### **Plastics**

###### **Contacts:**

Re: PET bottle and other plastics recycling: Frank Tammera, Pure Tech Research, Inc. 4 Barnet Road, Pinebrook, NJ 07054; (201) 227-1000.

Re: PET recycling and technical assistance to set up collection and processing centers: Steve Babinchak, St. Jude Polymer, 400 S. Broad Mt. Ave., Frackville, PA. 17931; (717) 874-1220.

Re: Industrial scrap recycling and potential to expand to municipal post-consumer plastics recycling: Roy Hollabaugh, Creative Polymer Marketing, 546 High St., Pottstown, PA. 19464; (215) 323-2755.

#### **PAPER COLLECTION AND PROCESSING TECHNOLOGIES**

##### **Cellulose Insulation**

###### **Contact:**

Bill Eidson, President, Western Community Industries, Inc. 5450 East Home Ave. Fresno, California 93727. (209) 251-8235.

###### **References:**

Morris, David, Institute for Local Self Reliance, A Technical Assistance Handbook for Community Based Cellulose Fabrication Plants, (Prepared for Community Services Administration under Contract No. 30208-C-77-02), 79 pp., 1978; 1717 18th Street, N. W., Washington, D.C. 20009. (202) 232-4108.

National Center for Appropriate Technology, Cellulose Insulation, A Look Beyond the Newsprint, 150 pp., 1978, Butte, Montana.

## **Animal Bedding**

### **Contact:**

Peter Basilice, Dice-a-Bed, South Depot Plaza, Tarrytown, New York, 10591. In New York: 914-631-8808; outside N.Y. 800-841-4141.

## **COMPOSTING TECHNOLOGIES**

### **Paunch Manure**

#### **Contacts:**

Steve Burdic, Nebraska Small Farms Action Group, Box 80729, Lincoln Nebraska, 68501, (402)475-3637. Detailed project report and financial investment prospectus available upon request.

Bob Bauermeister, Rt. 1, Box 80, Bennington, Nebraska, 68007, (402) 478-4428.

### **Vermicomposting**

#### **Contacts:**

Re: European and American research activities, and home systems:

Mary Applehof, Kalamazoo, Michigan, (616) 327-0108.

Re: experimental municipal facility for sludge and garbage vermicomposting, City Manager, Harvey Westerholm; 300 East Shepherd Street, Lufkin Texas, 75901.

## **References**

Appelhof, Mary; Worms Eat My Garbage, Kalamazoo, Michigan: Flower Press, 1980, 110 pp. \$7.95 postpaid; and Notes From the Underground, Home Vermicomposting System User Survey, \$3.00 postpaid.

Camp, Dresser & McKee, Inc., Compendium on Solid Waste Management by Vermicomposting, Cincinnati, Ohio 45268, August 1980: Municipal Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency.

## **AUTOMOBILE AND TRUCK TIRE PROCESSING**

### **Crumb Rubber**

#### **Contact:**

Steve Burdic, Nebraska Small Farms Action Group, Box 80729, Lincoln Nebraska, 68501, (402)475-3637. Detailed project report and financial investment prospectus available upon request.

## **DEMOLITION RECOVERY AND PROCESSING**

### **Building Materials Salvage Yard**

#### **Contact:**

Dan Knapp, Urban Ore, Inc., 1329 A Hopkins St., Berkeley, California 94702; 415-524-8883.

### **Recycled Concrete**

#### **Contact:**

Anthony Tomae, Rockrete Recycling Corporation, 168 Frontage Road, Newark, New Jersey 07114. 201-589-6031.

## **Remanufacturing**

### **Contacts:**

Re: Principal Researcher: Dr. Robert T. Lund, Research Professor of Technology and Policy and Professor of Manufacturing

Engineering at Boston University.

### **References:**

Lund, Robert T., "Remanufacturing: United States Experience and Implications for Developing Nations," Massachusetts Institute of Technology, Center for Policy Alternatives, Cambridge, Massachusetts, 02139. 1983; The World Bank.

Lund, Robert T., "Remanufacturing", *Technology Review*, February/March, 1983; pp.19-29.

## **ENERGY RELATED TECHNOLOGIES**

### **Processed Wood For Fuel**

#### **Contact:**

Vincent Amoia; Wood Fuel Buyer; The Proctor and Gamble Manufacturing Company, P.O. Box A, Staten Island, New York, 10314. 212-720-2779.

### **Steam And Electricity Cogeneration**

#### **Contacts:**

Re: Hulton Power Company: Walter and Bruce Hulton, Hulton Power Inc. 3819 Frankfort Ave. Philadelphia, Pennsylvania, 19124 (215) 535-6817.

Re: Project development and financing: Bob Bickings, Impact Management Systems. (215) 524-1150.

Re: Consumat systems: Gene White, 396 E. Church Rd., King of Prussia, Pennsylvania, 19406; (215) 275-9772.

## **APPENDIX 7**

### **HUMAN SERVICE PROVIDERS LOCATED IN THE CENTRAL WARD OF NEWARK**

#### **I. Community-Based Agencies**

Baxter Elderly Senior Center  
9 Summit Street

Baxter Terrace Recreation  
186 James Street

Blum Street Neighborhood Corp.  
Youth Patrol Young, Gifted & Black  
31 Blum Street

Central Ward Unit, Boys' and Girls' Club  
1 Avon Avenue

Central Ward Girls' Club  
159 Spruce Street

Central Ward Mini-Service Center  
291 Irving Turner Blvd.

Friendly Fulk Neighborhood Centers  
71 Boyd Street

Friendly Senior Center  
69 Lincoln Street

Grace West Manor Senior Center  
301 Irvine Turner Blvd.

Humanity Community Program  
10 Prospect Place

James White Manor Senior Nutrition Site  
516 Bergen Street

North Jersey Community Union  
105 Charlton Street

St. Rocco's Community Outreach Center  
712 Springfield Avenue

Springfield Avenue Community School  
447 18th Avenue

Tri-City People's Corporation  
675 So. 19th Street

#### **II. Agencies Located in the Central Ward Providing Services Inside and Outside of the Ward**

Catholic Youth Organization – QUEST  
226 W. Market Street

Coalition Six  
103 16th Avenue

Essex County Legal Aid Association  
Hall of Records  
High Street

Essex County Technical Careers Center  
91 W. market Street

Minority Contractors and Craftsmen Association  
111–119 Sussex Avenue

Newark Renaissance House  
80 Norfolk Street

The New Ark School, Inc.  
3 Irvine Turner Blvd.

St. Ann's Bi-Lingual Learning Center  
110 6th Avenue

St. Michael's Medical Center  
268 High Street

Salvation Army Center  
699–711 Springfield Avenue

Soul-O-House  
165 Court Street

Southern Christian Leadership of Essex  
County & Vicinity,  
94 Prince Street

University of Medicine and Dentistry of  
N.J. Hospital,  
100 Bergen Street

University Medicine & Dentistry of N.J.  
Community Mental Health Center  
100 Bergen Street

## HUMAN SERVICE PROVIDERS LOCATED IN THE EAST WARD OF NEWARK

### I. Community-Based Agencies

East Ward Community Center  
57 McWhorter Street

East Ward Mini-Center (UCC)  
444 Mulberry Street

Elizabeth Avenue Community Center  
64 Elizabeth Avenue

Essex Plaza Nutrition Project  
1060 Broad Street

Ironbound Children's Center  
317 Elm Street

Ironbound Community Corporation  
95 Fleming Avenue

Ironbound Community School  
432 Lafayette Street

Ironbound Educational and Cultural  
Center  
184 Edison Place

Ironbound Recreation Center  
Rome & St. Charles Streets

Ironbound Senior Center  
138 Clifford Street

James Street Neighborhood House  
19 James Street

Kretchner Home Senior Center  
100 Ludlow Street

Martin Lordi Annex/Salvation Army  
138 Clifford Street

Portuguese Sport Club  
51 Prospect Street

St. Columbia Neighborhood Club  
9 South Street

Salvation Army Ironbound Boys' and  
Girls' Club  
17 Providence Street

### II. Agencies Located in the East Ward Providing Services Inside and Outside the Ward

Accountants for the public Interest  
175 University Avenue, Rm. 14

American Civil Liberties Union  
381/2 Walnut Street

American Friends Service Committee  
40 Walnut Street

American Jewish Congress  
24 Commerce Street

American Rescue Workers  
84 Magazine Street

Aspira Inc. of New Jersey  
87 Halsey Street

Association for the Children of N.J.  
744 Broad Street

Boland Rehabilitation and Training Center  
450 Market Street

Boy Scouts of America, Essex Council;  
36 Park Place

Brazilian Center of N.J. Inc.  
45 Congress

Casa/Ucan (Community Agency Serving  
Alcoholics)  
14 Park Place

Child Care Network  
2 Cedar Street, 4th Fl.

City Without Walls  
140 Halsey Street

Club Espana  
180 New York Avenue

Club Social of Montevideo Uruguay  
397 Market Street

Community United for the Rehabilitation  
of the Addicted (CURA)  
61 Lincoln Park

The Co-op Family  
61 Lincoln Park

Dayton Street Community Health Center  
101 Ludlow Street

Education Law Center  
155 Washington Street, Room 209

Essex County Bar Assn, Lawyer Referral Service  
24 Commerce St.

Essex County Drug Abuse Clinic  
969 McCarter Highway

Essex-Newark Bilingual Legal Services  
1095 Raymond Blvd.

Essex-Newark Legal Services  
18 Rector Street

Essex-Newark Rutgers Legal Aid Clinic  
15 Washington Street

Family Service Bureau of Newark  
15 Fulton Street

Federacion de Estudiantes Latino Americanos  
Latin American Cultural Center  
103 Washington Street

F.O.C.U.S. of Newark, Inc.  
443 Broad Street

Goodwill Home and Missions  
79 University Avenue

Greater Newark Chamber of Commerce  
50 Park Place

Greater Newark Urban Coalition  
24 Commerce Street

Hispanic Chamber of Commerce  
139 Ferry Street

Independence High School  
179 Van Buren Street

Integrity, Inc.  
103 Lincoln Park

Interracial Council for Business Opportunities  
24 Commerce Street, Suite 1029

Jersey VEST  
80 Mulberry Street

Joint Connection  
176 Edison Place

Latin Educational Agency for the Development of Hispanic  
437 Broad

Leadership Development Group  
24 Commerce Street

Maternity and Infant Care Project  
877 Broad Street

Metropolitan Ecumenical Ministries  
969 McCarter Highway

Mount Carmel Guild, Essex  
17 Mulberry Street

National Alliance of Business  
50 Park Place, Suite 730

National Association for the Advancement of Colored People  
1028 Broad Street

National Conference of Christians and Jews  
50 Park Place

National Opportunity Camps  
24 Commerce Street

New Jersey Commission for Fair Broadcasting  
744 Broad Street, Suite 21

New Jersey Foundation for the Blind  
18 Green Street

New Jersey Haitian-American Cultural Foundation  
24 Branford Place, Suite 600

New Jersey State Opera  
1020 Broad Street

New Jersey Symphony Orchestra  
213 Washington Street 16th Floor

Newark Coalition for Neighborhoods  
38 1/2 Walnut Street

Newark Comprehensive Crime Prevention Project  
57 Green Street

Newark Day Center  
305 Halsey Street

Newark Emergency Services for Families  
303 Washington Street

Newark Mediaworks  
38 1/2 Walnut Street

Newark Museum  
49 Washington Street

Newark Talent Search Program of Essex County College  
31 Clinton Street

Newark Private Industry Council  
2 Central Avenue (lower level)

Newark Tenants' Council  
11 Hill Street

Newark Youth Job Services Offices  
1004 Broad Street

Noticias Portuguese  
24 Bruen Street

Planned Parenthood of Essex County  
151 Wasington Street

Puerto Rican Beneficial Association  
960 Freylinghuysen Avenue

Regional Health Planning Council HSA  
8 Park Place, Floor 2

Retired Senior Volunteer Program  
14 Park Place

St. James Hospital  
155 Jefferson Street

St. Johns Residence for Girls  
12 Amity Place

St. Patricks School  
75 Central Avenue

St. Timothy's House  
91 Congress Street

Salvation Army  
State Headquarters and Newark Central  
Corps  
80 Washington Street

Salvation Army Social Services and Cor-  
rectional Bureau  
45 Central Avenue

Salvation Army Rehabilitation Center  
65 Pennington Street

Seton Hall Law School Hispanic Center  
1095 Raymond Boulevard

Special Audiences, New Jersey  
24 Commerce Street, Suite 624

The Support Center  
744 Broad Street

Theater of Universal Images  
1020 Broad Street

United Community Corporation  
31 Fulton Street

United Labor Agency of Essex and West  
Hudson  
18 Rector Street

United Negro College Fund  
24 Commerce Street

United Way of Essex and West Hudson  
303 Washington Street

Urban League of Essex County  
31 Clinton Street, 11th Floor

Vindicate Society  
32 Central Avenue

Womanpower, Inc.  
50 Park Place, Suite 837

Women in Community Service (WICS)  
600 Broad Street

Youth Development Clinic of Newark  
309 Washington Street

## HUMAN SERVICE PROVIDERS LOCATED IN THE SOUTH WARD

### I. Community-Based Agencies

Ad House  
122 Clinton Place

International Youth Organization  
703 South 12th Street

The Leaguers  
750 Clinton Avenue

Little Shields  
487 Hawthorne Avenue

Neighborhood Housing Services of New-  
ark  
430 Chancellor Street

Roberto Clemente Towers Senior Nutri-  
tion Project  
75-95 Clinto Avenue

South Ward Mini-Service Center (UCC)  
491 Clinton Avenue

South Ward Senior Citizen Center  
761 Elizabeth Avenue

South Ward Unit  
Boys' and Girls' Clubs of Newark  
400 Hawthorne Avenue

Timothy Still Health Organization  
194 Clinton Avenue

### II. Agencies Located in the South Ward Providing Services Inside and Outside the Ward

Beth-Israel Medical Center  
Community Mental Health Center  
201 Lyons Avenue

Chancellor House  
466 Chancellor Avenue

Coalition of Health Services  
94 Maple Avenue

Community Agency Serving Alcoholics  
(CASA/UCAN)  
214 Hawthorne Avenue

Community Arts Center  
1186 Clinton Avenue

Hebrew Sheltering Home  
214 Chancellor Avenue

Kids Corporation  
84 Custer Avenue

Lyons Family Health Center  
122 Lyons Avenue

National Black Veterans Organization  
168 Elizabeth Avenue

Newark Beth Israel Medical Center  
201 Lyons Avenue

Newark Institute of Urban Programs  
505 Clinton Avenue

Newark Pre-School Council, Inc.  
300 Chancellor Avenue

Newark Senior Citizen Commission  
Golden Age Project  
760 Clinton Avenue

Metropolitan Comprehensive Health  
Group  
195 Clinton Avenue

Sickle Cell Anemia Project  
505 Clinton Avenue



## HUMAN SERVICES PROVIDERS LOCATED IN THE WEST WARD OF NEWARK

### I. Community-Based Agencies

Community Business Owners Association  
449 Central Avenue

Ivy Hill Jewish Senior Center  
250 Mt. Vernon Place

National Battered Women's and Children's Lobby  
202 Number 11th Street

Roseville Coalition  
124 Number 7th Street

Unified Vailsburg Services Organization  
40 Richelieu Terrace

Vailsburg Meals on Wheels  
40 Richillieu Terrace

Roseville Senior Center  
540 Orange Street

West Ward Mini-Center (UCC)  
497 Orange Street

### II. Agencies Located in the West Ward Providing Services Inside and Outside of the Ward

Architects' Community Design Center of New Jersey  
487 Orange Street

Baptist Home Society of New Jersey  
285 Roseville Avenue

Black Churchmen  
36 Roseville Avenue

Camp Nejeda  
153 Roseville Avenue

Care, Inc.  
85 Manor Drive, Suite 3H

Columbus Hospital  
495 North 13th Street

Easter Seals Society of New Jersey  
Community Service Residence  
1013 East Orange Avenue

Evangelistic Committee of Newark  
70 South 8th Street

Eye Institute of New Jersey  
15 South 9th Street

Father Vincent Monella Center of Italian Culture  
985 South Orange Avenue

The Learning Experience  
An Alternative High School  
304 South 12th Street

Multi-Phasic Drug Treatment Center  
15 Roseville Avenue

New Community Corporation  
755 South Orange Avenue

New Well  
15 Roseville Avenue

Newark Comprehensive Manpower Rehabilitation  
Project for Drug Abusers  
15 Roseville Avenue

Newark House  
134 South 10th Street

Protestant Community Centers  
17 North 6th Street

Self-Reliance Association of American Ukrainians  
734 Sanford Avenue

United Hospitals Medical Center  
15 South 9th Street

Work Impact of Newark  
70 South 8th Street

## **HUMAN SERVICE PROVIDERS LOCATED IN THE NORTH WARD OF NEWARK**

### **I. Community-Based Agencies**

Boys' and Girls' Club of Newark, Broadway Unit  
422 Broadway

La Casa De De Don Pedro  
75 Park Avenue

Mt. Pleasant Community Development Corp.  
41 Bloomfield Avenue

North Newark Hispanic Assn.  
86 Broadway

North Ward Center  
346 Mt. Prospect Avenue

North Ward Mini-Service Center  
480 Broadway

Residents for Community Action  
350 Bloomfield Avenue

Stephen Crane Senior Center  
58 Evergreen Lane

### **II. Agencies Located in the North Ward Providing Services Inside and Outside of the Ward**

Adult Learning Center  
Newark Board of Education  
380 Broad Street

Associated Community Councils of Newark  
229 Montclair Avenue

Birthright of Essex County  
622 Bloomfield Avenue

Catholic Community Services  
1 Summer Avenue

Catholic Youth Organization  
1 Summer Avenue

Meeting Emergency Needs with Dignity (MEND)  
1 Summer Avenue

COED (Center for Occupational Education Experimentation and Demonstration)  
223 Broadway

Essex County Network on Adolescent Pregnancy  
284 Broadway

Youth Consultation Service  
284 Broadway

Girls' Center of Essex County  
2 Ogden Street

Latin Education Agency for the Development of Hispanics  
437 Broad Street

Newark Family Resource Network  
407 Broad Street

Newark Police Athletic League  
One Lincoln Avenue

Newark Skills Center  
208 Broadway

North Newark Community Mental Health Center  
741 Broadway

Protestant Guild for the Deaf  
510 Parker Street

Public Service Employment Program (Newark)  
1 Lincoln Avenue

St. Mary's Residence for Children  
290 Mt. Prospect Avenue

St. John's Residence for Girls  
12 Amity Place

Technical Training Project, Inc.  
162 Broad Street

**APPENDIX 8**

**REASONS FOR SUPPORTING ADOPTION OF  
BEVERAGE CONTAINER DEPOSIT LEGISLATION\***

\* Derived from 1985 fact sheets prepared by the New Jersey Can and Bottle Bill Coalition.

7RY020382  
7RES 081182 (As)**Resolution of the City of Newark, N. J.**No. 7RES (A.S.)Date of Adoption AUG 11 1982**TITLE**

RESOLUTION ENDORSING CONCEPT OF MANDATORY BEVERAGE CONTAINER DEPOSIT LEGISLATION; FURTHER URGING THE LEGISLATURE AND GOVERNOR OF THE STATE OF NEW JERSEY TO ADOPT SUCH LEGISLATION.

Approved as to Form and Legality on Basis of Facts Set Forth

Factual contents certified to by

Councilman

Presents the following Resolution:

WHEREAS, metal, glass, and plastic beverages containers make up a significant portion of the litter which blights our roadsides, parks playgrounds, fields, streams and other public and private open space; and,

WHEREAS, the cleanup of such litter is a burdensome state and municipal expense which consumes labor which might otherwise be put to more constructive uses; and,

WHEREAS, the use of throwaway aluminum, steel, glass and plastic containers causes excessive consumption of energy and raw materials in container manufacturing; and,

WHEREAS, the disposal of such containers uses limited available landfill space and entails significant collection and cartage costs and disposal fees; and,

WHEREAS, broken glass from discarded glass beverage containers is a serious health and safety hazard and is a cause of damage to automotive and bicycle tires; and,

WHEREAS, legislation in eight (8) states provided incentives for recycling of beverages containers by requiring a refund value on all such containers; and,

WHEREAS, such legislation has resulted in dramatically reduced amounts of broken glass and other litter on roadsides elsewhere, has reduced consumption of energy and raw materials, and has provided increased employment in the recycling industry.

NOW, THEREFORE, BE IT RESOLVED BY THE MUNICIPAL COUNCIL OF THE CITY OF NEWARK, NEW JERSEY, THAT:

The concept of mandatory beverage container deposit legislation is hereby endorsed; and,

The Legislature and Governor of the State of New Jersey are urged to adopt such legislation; and,

The City Clerk is directed to forward copies of this resolution to appropriate legislators and to the Governor of this State.

CITY CLERK'S OFFICE  
NEWARK, N. J.25  
1982

Do not use space below this line

RECORD OF COUNCIL VOTE ON FINAL PASSAGE														
COUNCILMAN	AYE	NAV	N.V.	A.B.	COUNCILMAN	AYE	NAV	N.V.	A.B.	COUNCILMAN	AYE	NAV	N.V.	A.B.
BRANCH	✓				MARTINEZ S	✓				TUCKER	✓	✓		
CARRINO M	✓				PAYNE	✓				VILLANI	✓			
JAMES					RICE	✓				GRANT Pres	✓			
✓ — Indicates Vote					A.B. — Absent					N.V. — Not Voting				

CERTIFIED TO BY ME THIS  
12TH DAY OF AUGUST, 1982

Adopted at a meeting of the Municipal Council of the City of Newark, N. J. AUG 11 1982

Ralph T. Grant Jr.  
President of the Council

James J. Grant  
City Clerk

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# 1. LITTER

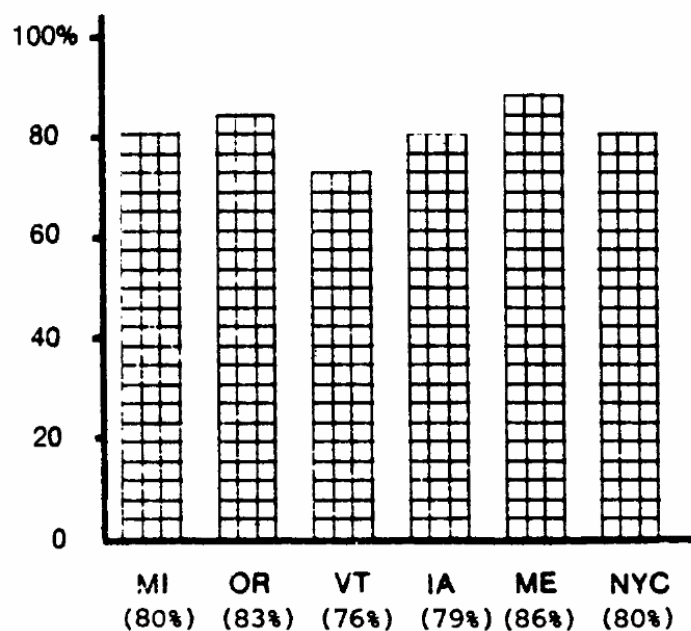
**The Problem** – Beverage containers are the most hazardous, least degradable and most prevalent form of litter.

- \* According to the U.S. Environmental Protection Agency, beverage containers comprise between 40 and 60% of all litter by volume.
- \* Beverage containers are the least degradable element of the waste stream. It takes 100 years for steel to decompose, 140 years for aluminum, and “practically forever” for plastic and glass bottles.
- \* A Pennsylvania study found that over 900,000 hours of farm labor are needed per year to clean up litter on the state’s farms, at a cost of over \$5 million. 80% of farmers in the state listed beverage containers as the number one litter problem.

**The Solution** – The Can & Bottle Bill is the most effective means for removing beverage containers from the litter stream.

- \* Litter reduction in bottle bill states is dramatic. Beverage containers are removed from the landscape, and **total** litter is reduced as people become more litter-conscious.
- \* Michigan, with a \$.10 deposit, has the highest return rate in the country.
- \* Reduced container litter creates a safer environment. A federal study estimated that \$10 million in medical bills would be saved annually with a national bottle bill.
- \* Based on a federal study, if New Jersey achieved a 90% redemption rate, similar to other states, total litter would be reduced by 30–40%.

Percentage Reduction Beverage Container Litter

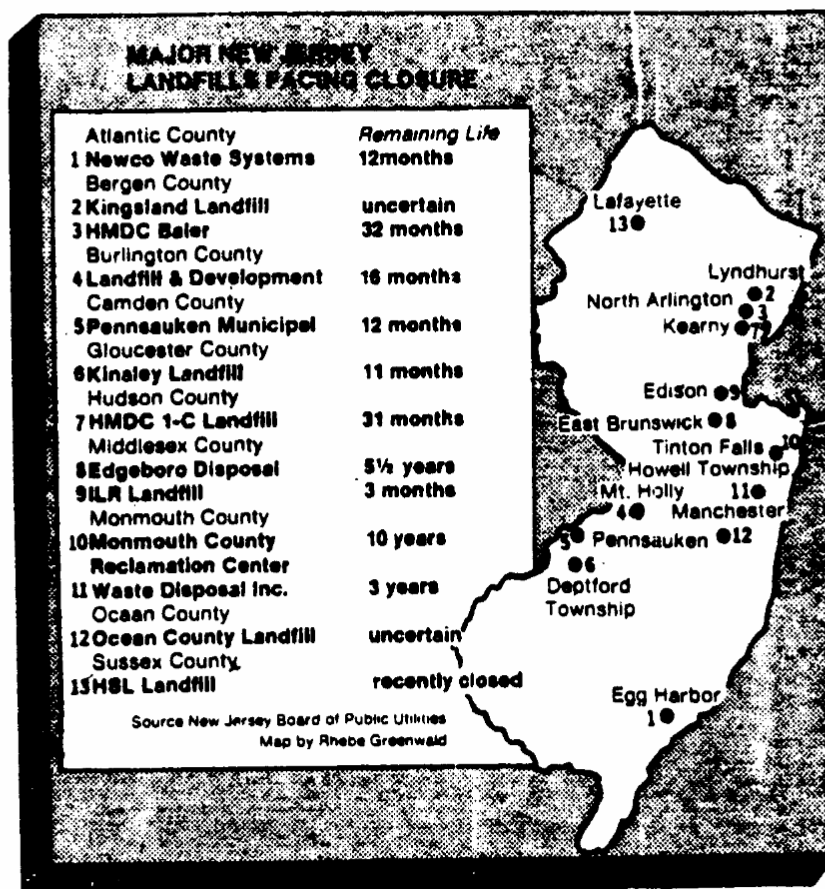


## 2. SOLID WASTE

**The Problem** – New Jersey faces a solid waste crisis of staggering proportions. Despite a major program to promote recycling, almost all beverage containers continue to flow into the state's already over-crowded landfills.

**The Solution** – Passage of the Can & Bottle Bill would produce immediate and substantial reductions in the solid waste stream.

- \* Reduction in solid waste in bottle bill states range from 5–9%, with a median of 6%.
- \* A 6% reduction in New Jersey's solid waste equals about 300,000 tons, or 22 days of landfill capacity per year.
- \* A reduction of 6% in the state's municipal solid waste stream would achieve savings of between \$17.1 and \$19.8 million annually for municipalities and taxpayers.
- \* Not only will the Can & Bottle Bill reduce solid waste, it will do so with impressive speed. A Michigan state survey found solid waste reductions of 6% within 7 months of implementation. New York achieved reductions of 9–15% in landfill space in its first year of a bottle bill.
- \* Such reductions would help ease the landfill crisis. The N.J. Board of Public Utilities estimates that 8 additional landfills will be closed within 3 years.



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### 3. NATURAL RESOURCES

**The Problem** – Throwaway beverage containers are extravagant wasters of energy, water and natural resources. They are costly and environmentally unsound compared to alternatives.

- \* The throwaway bottle, bi-metal can, and aluminum can use, respectively, 3.11, 2.7, and 3.6 times the amount of energy required for an 8-trip refillable glass bottle.
- \* The 8-trip refillable bottle uses 645 more BTUs than the throwaway bottle in its transport, but requires 33,000 less BTUs to be manufactured.
- \* It requires 184 ounces of water to produce, package and deliver 12 ounces of beer in a 10-trip refillable glass bottle. It takes 444 and 409 ounces of water to produce and package the same amount of beer in a throwaway glass bottle or bi-metal can.
- \* Throwaways generate three times the industrial waste of a 10-trip glass refillable, and twice that of a 5-trip container.
- \* Throwaways produce about 25% more air emissions than the 5-trip refillable. Bi-metal and aluminum cans are even more polluting, given the energy-intensive nature of their production processes.

**The Solution** – Passage of the Can & Bottle Bill will greatly reduce energy, water, and resource waste by promoting recycling and by increasing the percentage of refillable containers in use.

- \* Through increased recycling, a Can & Bottle Bill would produce energy savings of at least 24% for New Jersey, with substantial increases over that with each percentage shift to refillables.
- \* Passage of a national bottle bill would reduce water use by the beverage industry by at least 63%, and New Jersey's savings might be even higher because of the large glass industry.
- \* Bottle bills have achieved energy savings in every state, examples include: Vermont, 780 billion BTUs, Oregon, 1.4 trillion BTUs, and Michigan, 5.5 trillion BTUs.

## 4. EMPLOYMENT

Passage of a Can & Bottle Bill will produce a net increase in jobs for New Jersey. Production and use of throwaway containers is highly capital intensive. A deposit container system is highly labor intensive and creates a range of new jobs in recycling and container redemption industries.

- \* Every bottle bill state has experienced a net increase in jobs as a result of the law:

Michigan -	4,648	Oregon -	365
Massachusetts -	1,800	New York -	4,034-4,593
Vermont -	350-450	Maine -	626

- \* Opponents claim that a bottle bill will significantly affect employment in New Jersey's already troubled glass industry. The two biggest factors affecting employment in the glass industry, however, are increased mechanization and increasing market shares of aluminum cans and plastic containers. Between 1972 and 1983, glass industry jobs declined from 64,500 to 45,100, nationally, despite an increase in overall glass production.
- \* Based on the experience of other states, New Jersey can expect an increase in jobs of between 3,457 and 3,565 as a direct result of implementing the Can & Bottle Bill.
- \* Many of these jobs would be opened in depressed areas with high unemployment. As the recent Rockefeller Report on New York's deposit law notes, "A common argument that 'high paying, skilled, head of household' jobs are necessarily superior to 'minimum wage, unskilled' jobs when evaluating public policy is not appropriate when considering the employment effects of the bottle bill. Individuals who are younger, are less educated, who are from economically depressed areas, or who have few other job prospects will be drawn to lower paying, unskilled jobs. However, such individuals need employment no less than others. These jobs should be treated as significant when calculating the law's effects."
- \* Can & Bottle Bill opponents in the glass industry, including industry leaders like Owens-Illinois, are largely to blame for increased unemployment in the glass industry. According to **Business Week**, "Owens-Illinois has invested more than \$500 million since 1978 in new equipment, **slashing labor costs** to only 25% of manufacturing costs..."



## 5. RECYCLING

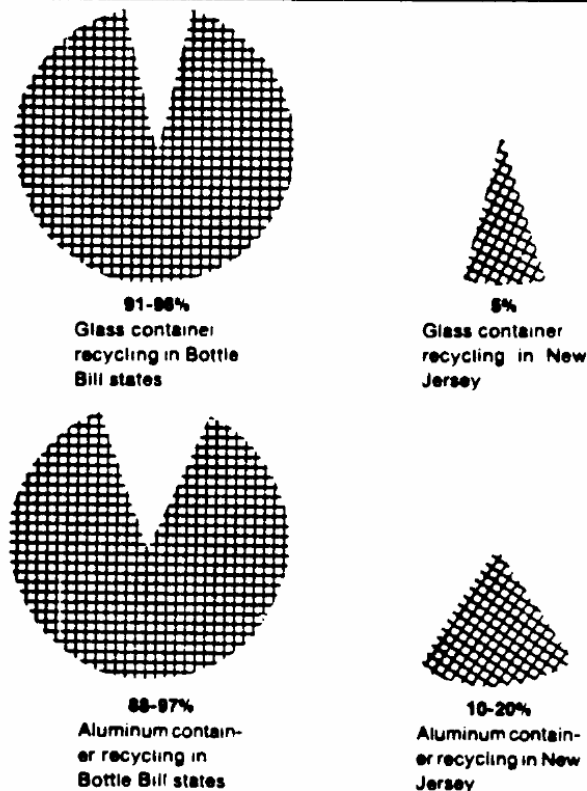
Despite a 5-year commitment to recycling, New Jersey has been unable to create an effective, statewide recycling program. According to the State Office of Recycling, glass recycling appears to have declined between 1980 and 1984 from 36,000 tons to 22,256 tons. In the same period, aluminum recycling appears to have fallen from 16,000 tons to 720 tons.

- \* New Jersey's recycling rate for glass bottles barely exceeded 5% in 1983.
- \* According to industry estimates, only 10-20% of aluminum cans were recycled in New Jersey last year. As a result Reynolds Aluminum recently suspended its New Jersey operations.

**A Partial Solution** – Recycling of beverage containers in bottle bill states is dramatically higher than in states without a deposit law. Bottle bills require that containers be consolidated and provide a steady and reliable flow of raw material, there are two necessary steps for increased recycling.

- \* Glass beverage container recycling is estimated by the U.S. EPA to be twelve times higher in bottle bill states.
- \* Aluminum recycling, by industry estimates, is five times higher than non-bottle bill states.
- \* According to industry, "practically all recycling of plastic containers is occurring in bottle bill states."

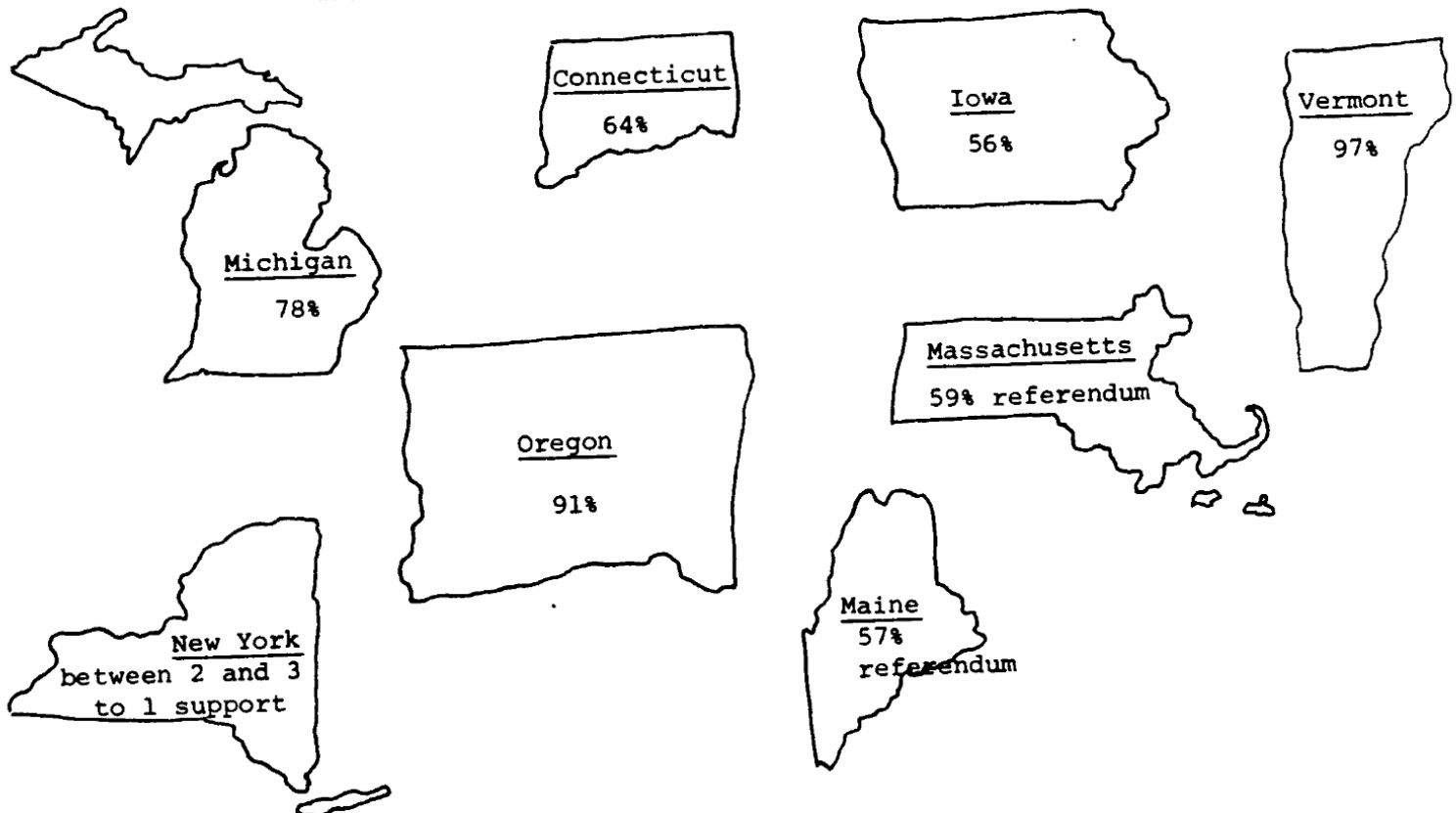
Estimated Beverage Container Recycling



## 6. PUBLIC SUPPORT

Nine states have passed bottle bills, beginning with Oregon in 1971. In almost fifteen years, no one has repealed a bottle bill despite intensive efforts to do so. The experience of other states has been favorable and consistent. Every state has experienced dramatic reductions in roadside litter. Every state has reported decreases in solid waste. Every state has achieved savings in water, raw material and energy use. In every state the public has shown overwhelming support for the law. Public support found in public opinion polls and referenda have been supportive of bottle bill efforts.

Levels of Public Support in Bottle Bill States



## 7. THE LITTER TAX

The beverage industry opposes the Can & Bottle Bill because it would force industry to absorb some of the costs of clean-up and disposal which it currently passes on the public at large. Industry has proposed as an alternative "the litter tax." This proposal places a small, per item tax on most consumer items to be used to fund litter pick-up programs.

- \* The "litter tax" is an industry proposal designed to sidetrack the Can & Bottle Bill. In a December, 1979 issue of Beverage World, an industry trade journal, bottle bill opponents were urged that, "Campaigning for an alternative litter bill while fighting a deposit bill is crucial."
- \* The litter tax would have only a limited effect. As noted by Newark Mayor Kenneth Gibson, the litter tax would have "no beneficial impact with respect to litter on private property and probably very little on watershed and other undeveloped public land."
- \* The Resource Conservation Committee, a nine-agency federal study panel, reported that "A litter tax would not provide any incentive to clean-up litter or reduce the rate of litter generation and a litter tax is *not an effective substitute* for a beverage container deposit system."
- \* Litter taxes have been repealed in six states (Connecticut, Arkansas, Colorado, California, Vermont and Kentucky). As Governor Lamm of Colorado noted, "After two years of implementation, the Legislature realized that the Litter Control Act was ineffective at reducing litter and created additional red tape and bureaucracy."
- \* The litter tax provides no incentive for individuals not to litter, unlike the bottle bill, and penalizes the law abiding citizen who must still pay the tax.
- \* The litter tax applies to a wide range of packaging, including pet food, breakfast cereal, toothpaste, motor vehicle parts, and many other items which are seldom, if ever, littered.
- \* The litter tax would have no effect on the state's solid waste and landfill crisis. Unlike the Can & Bottle Bill, which would reduce solid waste by encouraging recycling and the use of refillable containers, the litter tax provides no incentive to change the form of packaging.

## 8. THE NEW YORK EXPERIENCE

The following excerpts are drawn from The New York Returnable Beverage Container Law: The First Year, February 9, 1985, written by the Nelson S. Rockefeller Institute of Government, State University of New York, for the New York Temporary State Commission on Returnable Beverage Containers, a commission on which four out of seven members represent the New York bottling industry.

### Litter

"A comparative litter survey of New York and Pennsylvania indicates that **beverage container litter is 70 per cent lower** in New York." (page vi)

### Public Opinion

"Despite the Returnable Beverage Container Law being inconvenient, there is 'overwhelming support for the bottle law across all constituencies... there is no constituency which views the bottle law as a good law by less than a two to one margin. **Most groups view the law as a good law by a three to one ratio.**'" (page i)

### Job Quality

"A common argument that 'high paying, skilled, head of household' jobs are necessarily superior to 'minumum wage, unskilled' jobs... is not appropriate when considering the employment effects of the RBCL." (page 107)

### Solid Waste and Recycling

"In the first year of the Returnable Beverage Container Deposit Law there was a significant increase in the recycling of metal, glass, and plastic containers. In aggregate, the recycling rates for beverage containers translate into a statewide solid waste tonnage reduction of 3-5% per month. This yields a statewide **savings in landfill space of 9-15% per month.**" (page vi)

### Employment

"The Returnable Beverage Container Law increased employment in some types of production and distribution, and diminished employment in others. The law accerlerated national production and employment trends as they play out in New York, and also led to some types of job gains or losses not found elsewhere."

The Report found a **net increase** in New York state employment of between **4,034 - 4,593 jobs.** (pages 107-127)

## 9. SANITATION

Can & Bottle Bill opponents have repeatedly raised the specter of increased vermin infestation of retail stores following implementation of a deposit law. While retail stores will, indeed, have to cope with one more potential source for pests, it is clear that the vast majority of stores find the problems to be relatively minor. A recent survey of state and local health officials in bottle bill states found few, if any problems. (Survey conducted December, 1984)

### Massachusetts

**"Since the implementation of the Massachusetts Bottle Bill, we have not had a noticeable increase in the incidence of vermin in retail or food establishments."**

Richard A. Wilberg  
Principal Sanitarian  
City of Worcester

### Oregon

**"I never observed any evidence of vermin around beverage containers. In my opinion, the vermin issue is a red herring being raised by the bottling industry."**

Grocery stores are notorious for attracting vermin because of large quantities of food which are stored on the premises. We certainly have a rat problem in Portland Oregon...

We do not, however, have any information that leads us to conclude that deposit bottles have contributed to the rat problem."

Dr. Charles P. Schade  
Health Officer

### New York

**"We have found generally that supermarkets have been able to cope with the potential sanitation problems caused by returned beverage containers. Greater difficulties in maintaining sanitation appear to exist in some food stores, particularly in urban areas, as a result of the "Bottle Bill," however, we have found no significant overall increase in food store sanitation problems since the law was enacted."**

L.R. Crowell, D.V.M.  
Director Food Inspection  
State of New York  
City of Portland

### Maine

**"Retail stores work at keeping the storeroom area in sound sanitary condition and we have not seen any vermin or signs they were in the area. It is not a problem in our state."**

Beverly Hubbard  
Supervisor  
Division of Regulations  
Maine Dept. of Agriculture

# 10. NEW JERSEY WANTS A DEPOSIT LAW

Support for a New Jersey beverage container deposit law comes from a wide variety of governmental, professional, public interest and environmental groups and individual citizens as indicated by the listing below:

## Government

- 237 municipal councils by formal resolution
- 10 county boards of freeholders by formal resolution
- 72 mayors by formal petition
- Palisades Interstate Park Commission
- Delaware and Raritan Canal Commission
- Pinelands Commission
- Morris County Park Commission

## Solid Waste

- Camden County Solid Waste Advisory Council
- Morris County Solid Waste Advisory Council

## Agriculture

- New Jersey Farm Bureau
- Cumberland County Board of Agriculture
- Hunterdon County Board of Agriculture
- Mercer County Board of Agriculture
- Middlesex County Board of Agriculture
- Warren County Board of Agriculture
- Essex County Board of Agriculture
- Passaic County Board of Agriculture

## Professional

- Public Works Association of New Jersey
- New Jersey Association of Towns and Townships
- New Jersey Recreation and Park Association
- Retail Merchants Association

## Public Interest

- League of Women Voters of New Jersey
- New Jersey Public Interest Research Group
- American Lung Association

## Sportsmen

- New Jersey Council of Trout Unlimited
- Middlesex County Federation of Hunting and Fishing Clubs
- Hunterdon County Federation of Sportsmen's Clubs

## **Environmental**

New Jersey Environmental Lobby  
Association of New Jersey Environmental Commissions  
New York – New Jersey Trail Council  
Appalachian Mountain Club  
New Jersey Chapter of the Sierra Club  
League of Conservation Voters  
New Jersey Roadside Council  
Garden Club of New Jersey  
New Jersey Audubon Society

## **Media**

Home News, New Brunswick  
Star Ledger, Newark  
Bergen Record, Hackensack  
Asbury Park Press  
Daily Record, Morristown  
Courier News, Somerville  
Courier Post, Camden  
Herald News, Passaic  
Trenton Times, Trenton  
Burlington County Times

## **Citizens**

26,000 citizen signatures on deposit bill petitions

## **Other**

Many municipal and area environmental commissions, nature clubs, bicycle clubs and other environmental and recreational groups.